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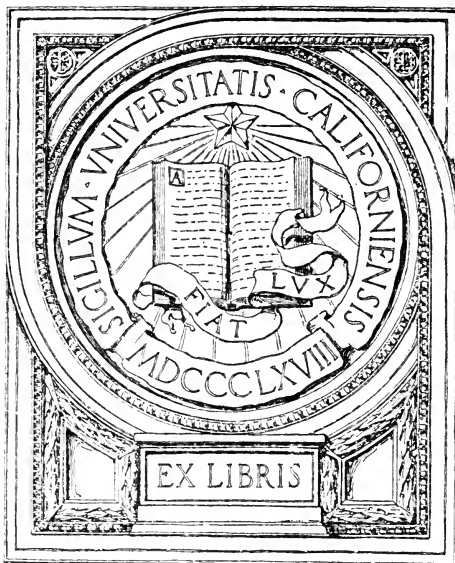


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INVESTIGATION

OF THE

PEOPLES GAS LIGHT & COKE COMPANY

FOR THE CHICAGO COUNCIL COMMITTEE ON

GAS, OIL AND ELECTRIC LIGHT

SUBMITTED TO THE GAS SUBCOMMITTEE
CONSISTING OF

Alderman WILLIAM J. PRINGLE, Chairman

Alderman THEODORE K. LONG

Alderman CHARLES E. MERRIAM



BY

WILLIAM J. HAGENAH

In Charge of Gas Investigation



THE HENRY O. SHEPARD CO., PRINTERS, CHICAGO.

1911

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1911

WILLIAM J. HAGENAH
FIRST NATIONAL BANK BUILDING
CHICAGO

HD 4494
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COMMITTEE ON
GAS, OIL AND ELECTRIC LIGHT
OF THE CITY COUNCIL OF THE CITY OF CHICAGO.

ALD. WILLIAM J. PRINGLE, *Chairman*,

ALD. JOHN S. DERPA,

ALD. CHARLES E. MERRIAM,

ALD. ALBERT W. BEILFUSS,

ALD. CHAS. TWIGG,

ALD. LEWIS D. SITTS,

ALD. THEODORE K. LONG,

ALD. JOHN P. STEWART,

ALD. JACOB A. HEY,

ALD. PETER REINBERG,

ALD. JAMES B. BOWLER,

ALD. ANTON J. CERMAK,

ALD. JAMES M. DAILEY.

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JAN 10 1900
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CHICAGO, April 17, 1911.

*To the Gas Subcommittee, Council Committee on Gas, Oil and Electric
Light, Honorable William J. Pringle, Chairman, Chicago:*

DEAR SIRS,— Pursuant to your instructions, an investigation has been made of the books, accounts and records of The Peoples Gas Light & Coke Company of this city in order to ascertain the reasonableness of the present net rate of 85 cents per thousand cubic feet for manufactured gas. The results of such investigation, together with the conclusions arrived at, are herewith submitted. As desired by your committee, the rate recommended for substitution in place of the present charge is a uniform rate for all purposes, regardless of the amount consumed.

In this connection, I beg to express my gratitude for the generous assistance which I have received from those associated with me in various capacities in the work of this investigation. Their loyalty is greatly appreciated. I feel especially indebted to Mr. W. J. Huddle for his valuable services in an engineering capacity, for which he deserves great credit.

Very respectfully yours,

WILLIAM J. HAGENAH,
In charge Gas Investigation.



INVESTIGATION
OF THE
PEOPLES GAS LIGHT & COKE COMPANY
FOR THE
Council Committee on Gas, Oil and Electric Light
CHICAGO.

HISTORICAL.

The Peoples Gas Light & Coke Company is an Illinois corporation located in the city of Chicago, incorporated under a special act of the legislature approved February 12, 1855, and operating under a perpetual charter with full power and authority to manufacture, distribute and sell gas for the purpose of lighting the city of Chicago, the streets, buildings and public places therein, and to this end to erect all necessary buildings, apparatus and facilities. The charter of the company provided that the consent of the city of Chicago should be secured to the laying of the mains, which consent was obtained by ordinance passed in August, 1858. The company as organized at present is a consolidation made pursuant to an act of the legislature under date of August, 1897, when seven independent and more or less competitive companies were merged. The companies embraced in the combination were the Peoples Gas Light & Coke Company, the Chicago Gas Light & Coke Company, the Consumers Gas Company, the Equitable Gas Light & Fuel Company, the Suburban Gas Company, the Lake Gas Company, the Illinois Light, Heat & Power Company and the Chicago Economic Fuel Gas Company. Since 1897 the company has extended its sphere and obtained complete control of the gas business in the city of Chicago by absorbing several minor plants and the leasing of others.

The history of the company has been marked by much strife and litigation, in which the City Council of Chicago and the Legislature of the State have played a prominent part. Because of the importance of the conditions under which the property was developed, as reflected in the financial position of the company, and the necessarily frequent reference to some of these conditions because of their bearing on the present cost of

gas, a brief outline of the more important steps in the development of the consolidation is presented.

In February, 1849, there was incorporated by special act of the State Legislature the Chicago Gas Light & Coke Company with the exclusive right to manufacture, distribute and sell gas in the city of Chicago for a period of ten years. There was no requirement that the consent of the city should be obtained before entering upon its charter rights.

The Consumers Gas Fuel & Light Company of Chicago was incorporated in January, 1882, and on April 28, 1882, the Common Council of that city granted to the company the right to construct, maintain and operate gasworks within such city, together with the right to lay mains, feeders and pipes in all avenues, streets, alleys and public buildings in the city for lighting and fuel purposes. The same ordinance prescribed a lighting standard of sixteen candles and fixed the price of gas at \$1.75 per thousand cubic feet, with a discount of 75 cents per thousand cubic feet to customers using 100,000 cubic feet per annum. The operations of this company were restricted to the city of Chicago.

This company was unfortunate and in May, 1886, all of its property was sold under a decree of the United States Court on foreclosure of the mortgage given by it, and in November, 1886, the Consumers Gas Company was formed with a capital stock of \$5,000,000, which company acquired all the property, rights, privileges and franchises previously owned by the Consumers Gas Fuel & Light Company, but sold through court proceedings.

The Suburban Gas Company was formed in 1884 with authority to manufacture, distribute and sell gas within the limits of Cook County. Soon after its incorporation the village of Lake View, now a part of the city of Chicago by annexation, granted an ordinance to this company authorizing it to lay mains and service pipes in the public streets, alleys, avenues, highways or grounds within the limits of said town, prescribing a lighting quality of sixteen candles, and fixed the price of gas for public lighting at \$1.50 per thousand cubic feet and for commercial consumption at \$2.00 per thousand cubic feet, with a prompt payment discount of 50 cents per thousand cubic feet. This company has always been controlled by the Chicago Gas Light & Coke Company, referred to above.

The Equitable Gas Light & Fuel Company was organized in August, 1886, with a capital stock of \$3,000,000. This company secured an ordinance from the city of Chicago granting to it the usual authority for the occupancy of the streets and highways with its mains, services and feeders, and fixed the lighting standard at sixteen candles and the rate at \$1.75 per thousand cubic feet, with a discount of 25 cents per thousand cubic feet.

The Hyde Park Gas Company, with a capital stock of \$300,000, was incorporated under the general incorporation act of the State of Illinois

in May, 1871, with the power to manufacture, distribute and sell gas in the town of Hyde Park, a municipality adjoining the city of Chicago, but since by annexation made a part of it. By ordinance in 1871, the company was granted permission to lay its mains, pipes, feeders and services in any and all of the streets, alleys, avenues, highways, parks, squares and public grounds throughout said town north of the center line of Sixty-seventh street. This permission was made exclusive north of the center line of Sixtieth Street for a period of fifteen years. The town of Hyde Park was given the right to purchase the plant within a period of fifteen years and a method was provided for valuing the property in case of sale to the municipality. This latter provision was subsequently repealed and the territory of the company was enlarged by ordinance in 1885 so as to embrace the section south of Sixty-seventh Street. The Hyde Park Gas Company was controlled by the Consumers Gas Company.

In November, 1885, the Illinois Light, Heat & Power Company was formed under the general incorporation laws of the State to engage in the manufacture of gas. The capital stock of this company was \$600,000. This company never received a grant of authority from the city of Chicago, but sold all of its product directly to the Peoples Gas Light & Coke Company.

The Lake Gas Company was organized in July, 1881, under the general incorporation laws of the State of Illinois for the purpose of manufacturing, distributing and selling gas in the town of Lake, a municipality adjoining the city of Chicago, but since made a part of that city by annexation. This company was incorporated with a capital stock of \$800,000. It never directly acquired authority to operate in the town of Lake, but secured such authority through an ordinance granted by that town to the Northwestern Gas Works Company, a New York corporation authorized to furnish illuminating gas for a period of twenty-five years and to occupy for this purpose the necessary streets, alleys, avenues, highways and public grounds in the town of Lake. This ordinance fixed the price of gas for private consumption at a price not to exceed \$2.50 for the equivalent in an illuminating power or value of one thousand cubic feet of coal gas of fourteen candle power. The company was given the exclusive privilege to light the streets, highways, public grounds and buildings of the town. It was controlled by the Consumers Gas Company.

The Chicago Economic Fuel Gas Company was incorporated in December, 1889, under the general incorporation act of the State. The capital stock was \$1,000,000. On December 22, 1890, the City Council of Chicago granted to this company the right to construct and operate works for the manufacture of fuel gas only within the city and also the right to lay mains, pipes and feeders in all the streets, avenues, alleys and public places of the city for the distribution of natural and manufactured fuel gas exclusively. The privileges conferred by this ordinance were for the

term of twenty-five years, with the permission reserved to the city to purchase the plant at an appraised value at any time before the expiration of twenty years. The appraisal, it was provided, should contain no allowance for rights, privileges and franchises granted by the city.

This ordinance specified that the company should charge rates not to exceed 60 cents per thousand cubic feet for natural gas, nor to exceed 50 cents per thousand cubic feet for manufactured gas, with a prompt payment discount of 10 cents per thousand cubic feet. It was also provided that the company should pay annually to the city of Chicago in consideration of the privileges granted an amount equal to five per cent on the gross receipts of the company, and in addition to the above provisions the company was prohibited from at any time entering into any combination, directly or indirectly, with any gas company concerning rates to be charged for gas, and any violation of this provision should work a forfeit of this grant.

The above ordinance was subjected to frequent amendment. One week after the original grant the act was amended by depriving the city of the right to order extensions and also depriving it of the right to purchase the plant. In July, 1891, the act was again amended by authorizing the company to construct and operate works for the manufacture of illuminating and fuel gas within the city and to construct mains and feeders in the public streets, avenues and highways for the distribution of illuminating and manufactured fuel gas. A new schedule of rates was provided fixing the charge for illuminating gas at \$1.10 per thousand cubic feet, for natural gas 60 cents per thousand cubic feet, and for manufactured fuel gas 50 cents per thousand cubic feet, with a prompt payment discount of 10 cents per thousand cubic feet in each case.

The same amendment provided for the compensation to the city at the rate of 5 per cent on the gross earnings from the sale of natural gas and manufactured fuel gas and at the rate of 3 per cent on the gross earnings from the sale of illuminating gas.

In 1891 the company entered into a contract with the Indiana Natural Gas & Oil Company whereby the latter company was to furnish natural or manufactured fuel gas to the Chicago Economic Fuel Gas Company, which product this company was to distribute through its pipes and mains in the city of Chicago. Under this contract the Indiana Natural Gas & Oil Company pumped its product to the State line, where it was delivered to the Chicago Economic Fuel Gas Company, an arrangement which is still in effect. This plant continued its individual existence until it was merged with the Peoples Gas Light & Coke Company in 1897, since which date the consolidated company has continued to distribute natural gas to the consumers in Chicago at the rate specified in the amended ordinance granting the right to the Chicago Economic Fuel Gas Company. This company is discussed at greater length in another part of this report.

The Mutual Fuel Gas Company was incorporated in April, 1889, under the general incorporation laws of the State. It had an authorized capital stock of \$5,000,000, of which \$1,500,000 was issued. This company succeeded to the grant of authority which the village of Hyde Park made under date of March 21, 1889, to Messrs. Hank & McClary. This firm was authorized to construct and operate a system of works for the furnishing of natural and manufactured gas and petroleum oil, and for this purpose it was empowered to pipe the streets, avenues and other public places with its mains, feeders and tubes. The ordinance provided that gas should be sold at the rate of \$1.25 per thousand cubic feet for illuminating purposes, and 90 cents per thousand cubic feet for heating purposes, with a 20 per cent prompt payment discount. The lighting quality of the gas was fixed at sixteen candles.

In April, 1887, the Chicago Gas Trust Company was formed with a capital stock of \$25,000,000, consisting of 250,000 shares of the par value of \$100 each, all of which was issued. This company acquired a majority interest in the shares of the capital stock of the Chicago Gas Light & Coke Company, the Peoples Gas Light & Coke Company, the Equitable Gas Light & Fuel Company and the Consumers Gas Company. By reason of the ownership of these shares the Chicago Gas Trust Company also controlled the Suburban Gas Company, the Hyde Park Gas Company, the Lake Gas Company and the Illinois Light, Heat & Power Company.

The purpose of the incorporation of the Chicago Gas Trust Company, as expressed in its articles of incorporation, was twofold: first, for the purpose of erecting and operating gas-works for the manufacture and sale of gas in Chicago and other places in this State; and second, to purchase and hold, or sell, the capital stock, or purchase or lease or operate the property, plant, good-will, rights and franchises of any gas-works or gas company or companies, or of any electrical company or companies, in Chicago or elsewhere, etc. The company sought to exercise the powers claimed under the second section only and for that purpose bought a majority of the shares of all the stock of the four companies above mentioned whereby it might have the control of all the gas companies in the city of Chicago and thus destroy competition and monopolize the gas business.

The validity of the organization of the company as above outlined was attacked by the Attorney-General of the State of Illinois, who filed an information in quo warranto. The decision of the court in this proceeding was rendered in November, 1889, and held that the corporation so formed was not for a legal purpose and that all acts done by it toward the accomplishment of such object was illegal and void. Prior to this time, in 1887, all the shares of the capital stock of the four main companies which were held through stock ownership by the Chicago Gas Trust Company and which shares stood in its name, had been pledged by the Chicago Gas

Trust Company with the Fidelity Insurance Trust & Safe Deposit Company of Philadelphia for the security of the payment of the bonds then or thereafter issued by the Chicago Gas Light & Coke Company, the Peoples Gas Light & Coke Company, the Consumers Company and the Equitable Gas Light & Fuel Company.

When the Supreme Court held in its decision of November, 1889, that the acts of the Chicago Gas Trust Company were illegal and void, thus practically dissolving the corporation, it was manifest that some arrangement was imperatively necessary with respect to the shares of the capital stock of the holding company then outstanding aggregating \$25,000,000, and such proceedings were thereupon had that the certificates for the shares of the four companies controlled in the name of the Chicago Gas Trust Company and held for the Fidelity Insurance Trust & Safe Deposit Company were exchanged, the Fidelity Company surrendering the certificates it held for new certificates to an equivalent amount made out by the four principal companies for the number of shares by them severally issued to the Chicago Gas Trust Company in the name of the Fidelity Insurance Trust & Safe Deposit Company. The Fidelity Company thereupon issued to the stockholders of the Chicago Gas Trust Company its own trust certificates against the shares of the capital stock so in its name, the certificates for which it held. The total amount of the certificates thus issued by the Fidelity Insurance Trust & Safe Deposit Company was \$24,885,100. The Fidelity certificates recited that each holder was entitled to the proportional part of 250,000 undivided shares in and to the several Chicago gas companies deposited with the Fidelity Insurance Trust & Safe Deposit Company under the several deeds of trust. In the meantime the Chicago Gas Trust changed its name to the Chicago Gas Company, and after the arrangement for the protection of the stockholders of that company had been made with the Fidelity Insurance Trust & Safe Deposit Company, as indicated, the Chicago Gas Company, formerly the Chicago Gas Trust Company, was dissolved according to law.

The situation remained in this condition until April, 1894, when another Attorney-General of the State of Illinois filed a bill against the Fidelity Insurance Trust & Safe Deposit Company, setting up that the arrangement above described was illegal under the laws of the State of Illinois, and an injunction was issued by the circuit court of Cook county, restraining the payment of any dividends to the Fidelity Insurance Trust & Safe Deposit Company. This step again necessitated the immediate reorganization of the properties. Thereupon a reorganization committee was formed and all of the certificates issued by the Fidelity Insurance Trust & Safe Deposit Company of Philadelphia were exchanged for certificates of the Central Trust Company of New York, preliminary to such reorganization. Thereafter the Legislature of Illinois passed an act generally known as the Gas Consolidation Act, in June, 1907, which provided

in substance (1) that all gas companies now organized, or hereafter to be organized, were authorized to sell, transfer and lease all their property, rights and franchises to any other gas company doing business in the same city; (2) that any gas company now organized, or hereafter to be organized, doing business in the same city, could consolidate and merge into a single corporation which should be one of the merging or consolidating companies; and (3) that all companies should be empowered to manufacture and distribute gas for fuel purposes and to distribute natural gas.

Pursuant to this statute a consolidation was effected of the seven companies previously mentioned. The legality of this act was subsequently sustained by the Supreme Court of Illinois in the action by the State's Attorney of Cook county to contest its validity and constitutionality. In order to carry out and make possible the merger under the above act it became necessary to increase the capital stock of the Peoples Gas Light & Coke Company from \$4,000,000 to \$25,000,000. As already explained in the preceding paragraphs, there were outstanding at this time certificates issued by the Fidelity Insurance Trust & Safe Deposit Company which were listed upon the stock exchanges of the country aggregating \$24,885,100. There were also outstanding some shares of the capital stock of the various four main companies, which had never been acquired by the Chicago Gas Trust Company, nor brought within the terms of the trusts with the Fidelity Insurance Trust & Safe Deposit Company, amounting to \$44,300, and the difference between these amounts and the \$25,000,000 of the capital stock as increased was turned into the treasury of the Peoples Gas Light & Coke Company.

The basis of exchange of the stocks of the four principal companies for the shares of the Peoples Gas Light & Coke Company as increased was the subject of active and long-continued negotiation among the several committees representing the stockholders of the various companies to be merged under the consolidation act and the reorganization committee. The shares of some of the companies were valued considerably higher than those of others and the final settlement was made upon a basis providing for the exchange of the stock of the various competing companies for stock of the Peoples Gas Light & Coke Company, according to the estimated or known market value of the shares of each company.

The bonds of the consolidated companies were all assumed by the new corporation, which was authorized to issue \$40,000,000 of 5 per cent refunding bonds, of which \$29,046,000 was reserved to retire prior lien bonds of the constituent companies as follows:

First Mortgage 6% Bonds of The Peoples Gas Light & Coke Company, dated November 9, 1874, and due November 1, 1904....	\$ 2,100,000
Second Mortgage 6% Bonds of The Peoples Gas Light & Coke Company, dated December 5, 1874, and due December 1, 1904..	2,500,000
First Consolidated 6% Bonds of The Peoples Gas Light & Coke Company, dated April 1, 1893, and due April 1, 1943.....	4,900,000
First Mortgage 5% Bonds of the Chicago Gas Light & Coke Company, dated July 1, 1887, and due July 1, 1937.....	10,000,000
First Mortgage 6% Bonds of The Equitable Gas Light & Fuel Company of Chicago, dated 1885, and due July 1, 1905.....	2,000,000
First Mortgage 5% Bonds of the Consumers Gas Company, dated December 1, 1886, and due December 1, 1936.....	4,246,000
First Mortgage 7% Bonds of the Illinois Light, Heat & Power Company, dated November 18, 1885, and due November 1, 1915...	500,000
First Mortgage 6% Bonds of the Lake Gas Company, dated July 1, 1885, and due July 1, 1915.....	300,000
First Mortgage 5% Bonds of the Chicago Economic Fuel Gas Company, dated January 2, 1893, and due January 1, 1916.....	2,500,000
Total.....	\$29,046,000

Since August, 1897, no bonds have been sold or shares of stock issued by the Peoples Gas Light & Coke Company except for an equivalent amount in cash, less such discount upon the bonds sold as the condition of the money market has from time to time required.

On January 10, 1898, the Hyde Park Gas Company and the Mutual Fuel Gas Company were merged with the Peoples Gas Light & Coke Company and under the agreement of the consolidation there was issued by the Mutual Fuel Gas Company, and guaranteed by the Peoples Gas Light & Coke Company, \$5,000,000 of 5 per cent bonds. In the following year the Calumet Gas Company was included in the merger and under the agreement of the consolidation there was paid for this company \$500,000 to be used in retiring an equivalent amount of that company's bonds, leaving outstanding bonds to the amount of \$250,000. The capital stock of this company and also the stock of the Hyde Park Gas Company and the Mutual Fuel Gas Company were surrendered and cancelled.

The Mutual Fuel Gas Company had been manufacturing and distributing a fuel gas which proved very dangerous in operation. It was an odorless product and its escape could not be detected by the sense of smell, with the result that many accidents occurred caused by the escape of this fluid. It became necessary to adopt the manufacture and distribution of a different kind of gas, and certain of the owners of the Mutual Fuel Gas Company thereupon organized the Universal Gas Company and obtained a charter from the State and an ordinance from the city of Chicago in August, 1894. The Universal Gas Company erected a large plant near Thirty-first street and the Chicago River in the city of Chicago, and by means of large mains conveyed the gas there manu-

factured to its plant in Hyde Park, from whence it was distributed to the patrons and consumers. This company supplied a few consumers along the lines of its transmission main, but practically its only business was the manufacture of gas for distribution in Hyde Park. The Universal Gas Company was acquired by individuals largely interested in the Peoples Gas Light & Coke Company, but was never merged into that company, and finally in 1906, its plant was leased to the Peoples Gas Light & Coke Company and has since been operated by that company.

The Ogden Gas Company was incorporated in 1895, being authorized by the city to construct and operate gas-works upon and under the streets, avenues and public places of the city of Chicago for the purpose of manufacturing and distributing illuminating and fuel gas. Its franchise grant extended over a period of fifty years. The lighting quality of the gas was prescribed and the price therefor fixed at 90 cents per thousand cubic feet, with a rate of 75 cents per thousand cubic feet to the city of Chicago. Under the ordinance the company was required to pay the city annually $3\frac{1}{2}$ per cent of its gross revenue from the sale of gas. The plant was constructed by a corporation representing the same interests as those to whom the franchise was granted. This company was prominent in a number of serious rate wars which finally culminated in the agreement by the Peoples Gas Light & Coke Company to lease the property, with the consent of the City Council of Chicago, and at a specified date in the future to purchase the property and redeem the bonded indebtedness. This agreement was the result of a rate war with the competing company, the Mutual Fuel Gas Company, which had leased the mains of the Peoples Gas Light & Coke Company, and was effected after the purchase of a controlling interest in the Ogden Gas Company by a syndicate friendly to the Peoples Gas Light & Coke Company. The Ogden Gas Company has since been conducted and operated by the latter company.

GROWTH OF BUSINESS.

Since the consolidation of 1897 the growth of the company has been very rapid. With the elimination of the ruinous competition and all the expense incident to the numerous rate wars and litigation, the position of the business under a single management has steadily improved. New uses have been found for gas and the consumption has increased enormously. Since the above date the number of meters installed with consumers has been increased from 230,293 to 522,536; the number of gas stoves has increased from 20,343 to 305,279; the mileage of street mains from 1,584 miles to in excess of 2,500 miles; while the earnings from the sale of gas have more than doubled. At the same time the capital liabilities of the company have been increased to \$35,000,000 of stock and \$40,096,000 of bonds. The plant, which at the time of the merger con-

sisted of a number of scattered manufacturing stations, has been greatly improved by the better location of stations for the most economical manufacturing results. Several of the stations obtained at the time of the consolidation were not in the best of physical condition and had apparently been constructed to satisfy the immediate needs and at as reasonable a cost as possible in the hope of ultimately disposing of the property. Some of these stations have since been dismantled and replaced by modern producing units, while all the stations, both those used for manufacturing and for pumping purposes, are in excellent condition and contain the most modern and efficient apparatus. The capacity of the stations has been greatly enlarged to meet current needs and provision has been made for extensive enlargements of the plant to supply capacity for future requirements.

The following tables show the condensed income accounts, the condensed balance-sheets and the plant statistics covering the period from 1898 to 1910, inclusive, as contained in the published annual statements:

CONDENSED INCOME ACCOUNT.
1898-1910.

Year.	Gross Earnings.	Operating Expenses.	Net Earnings.	Interest on Bonds.	Dividends.	Surplus at Close of Year.
1898.....	\$7,265,526.48	\$3,795,301.53	\$3,470,224.95	\$1,842,300.00	.....	\$1,627,924.95
1899.....	8,096,319.74	4,277,447.11	3,818,872.63	1,857,300.00	\$1,720,128.00	241,444.63
1900.....	9,090,337.36	5,031,962.41	4,058,374.95	1,857,300.00	1,720,128.00	480,946.95
1901.....	9,663,746.28	5,404,277.66	4,259,468.62	1,857,300.00	1,784,632.50	617,536.12
1902.....	11,058,413.56	6,543,797.40	4,514,616.16	1,857,300.00	1,978,146.00	679,170.16
1903.....	11,854,800.52	7,096,793.66	4,758,006.86	1,857,300.00	1,978,146.00	922,560.86
1904.....	12,014,084.67	7,026,390.38	4,987,694.29	1,853,550.00	1,978,146.00	1,155,998.29
1905.....	12,284,363.48	7,305,773.32	4,978,590.16	1,829,300.00	1,978,146.00	1,171,144.16
1906.....	11,680,044.42	7,569,523.69	4,110,520.73	1,819,300.00	1,648,455.00	642,765.73
1907.....	13,146,367.71	8,817,035.08	4,329,332.63	1,810,550.00	1,978,146.00	540,636.63
1908.....	13,738,969.97	9,098,975.75	4,639,994.22	1,884,299.99	1,978,146.00	777,548.23
1909.....	14,561,588.50	9,539,184.99	5,022,403.51	1,909,300.00	2,332,036.50	781,067.01
1910.....	15,530,349.50	10,393,384.16	5,136,965.34	1,982,633.33	2,450,000.00	704,332.01

CONDENSED BALANCE SHEETS.

1898-1910.

ASSETS.		1898.	1899.	Increase or Decrease.	1900.	Increase or Decrease.
Real Estate, Franchise, Tunnels, Street Mains, Meters, Services, etc.....		\$61,762,139.82	\$65,420,560.93	\$3,658,421.11	\$66,421,317.15	\$1,000,756.22
Materials.....		433,914.73	467,657.13	13,742.40	490,489.30	22,832.17
Securities.....		1,451,577.54	1,475,955.67	24,378.13	1,475,955.67	
Accounts Receivable.....		174,645.19	200,756.08	26,110.89	186,174.45	14,561.63
Deposits with Agencies for Bond Coupons.....		355,156.09	354,364.28	791.81	352,474.50	1,889.78
Gas Bills Receivable.....		742,827.85	889,642.02	146,814.17	904,048.02	14,406.00
City of Chicago.....		66,717.71	140,422.67	73,704.96	12,695.32	127,727.35
Cash.....		1,606,303.56	196,269.73	1,410,033.83	468,828.65	272,558.92
Central Trust Co.....		1,972,586.78		1,972,586.78		
Bills Receivable.....						
Total Assets.....		\$68,585,869.27	\$69,145,628.51	\$559,759.24	\$70,311,983.06	\$1,166,354.55
LIABILITIES.						
Capital Stock.....		\$30,000,000.00	\$30,000,000.00		\$30,000,000.00	
Mortgage Bonds.....		34,246,000.00	34,496,000.00	\$250,000.00	34,496,000.00	
Deposits, security for gas bills.....		120,189.00	77,819.50	42,369.50	69,069.50	\$ 8,750.00
Accounts Payable.....		237,047.31	348,386.42	111,339.11	344,304.02	4,082.40
Coupons past due.....		356,645.00	355,990.00	655.00	354,230.00	1,760.00
Bond Interest accrued.....		217,858.34	217,858.34		217,858.34	
Profit and Loss.....		3,408,129.62	3,649,574.25	241,444.63	4,130,521.20	480,946.95
Bills Payable.....					700,000.00	700,000.00
Depreciation and Reserves.....						
Total Liabilities.....		\$68,585,869.27	\$69,145,628.51	\$559,759.24	\$70,311,983.06	\$1,166,354.55

CONDENSED BALANCE SHEETS.

1898-1910.

17

ASSETS.	1901.	Increase or Decrease.	1902.	Increase or Decrease.
Real Estate, Franchise, Tunnels, Street Mains.				
Meters, Services, etc.	\$69,009,441.63	\$2,588,124.48	\$70,305,802.27	\$1,296,360.64
Materials	578,179.01	87,089.71	782,582.15	204,403.14
Securities	2,196,596.28	720,040.61	2,245,681.53	49,085.25
Accounts Receivable	315,439.06	129,264.61	369,850.82	54,411.76
Deposits with Agencies for Bond Coupons	351,331.07	1,143.43	350,804.87	526.20
Gas Bills Receivable	865,230.22	38,817.80	851,937.71	13,292.51
City of Chicago	49,802.35	37,107.03	935,819.47	49,802.35
Cash	1,785,922.81	100,360.00	104,227.35	850,103.34
Central Trust Co.	100,360.00			
Bills Receivable				
Total Assets	\$75,252,302.43	\$4,940,319.37	\$75,946,706.17	\$694,403.74
LIABILITIES.				
Capital Stock	\$35,000,000.00	\$5,000,000.00	\$35,000,000.00	
Mortgage Bonds	34,496,000.00		34,496,000.00	
Deposits, security for gas bills	72,724.50	3,655.00	84,712.50	\$ 11,988.00
Accounts Payable	364,457.27	20,153.25	368,192.85	3,735.58
Coupons past due	353,205.00	1,025.00	352,715.00	490.00
Bond Interest accrued	217,858.34		217,858.34	
Profit and Loss	4,748,057.32	617,536.12	5,427,227.48	679,170.16
Bills Payable		700,000.00		
Depreciation and Reserves				
Total Liabilities	\$75,252,302.43	\$4,940,319.37	\$75,946,706.17	\$694,403.74

CONDENSED BALANCE SHEETS.

1898-1910.

ASSETS.	1903.	Increase or Decrease.	1904.	Increase or Decrease.
Real Estate, Franchise, Tunnels, Street Mains, Meters, Services, etc.....	\$71,145,318.14	\$839,515.87	\$72,188,762.94	\$1,043,444.80
Materials.....	1,000,476.30	217,894.15	831,901.95	168,574.35
Securities.....	2,243,681.53	2,000.00	2,243,681.53	
Accounts Receivable.....	444,505.16	74,654.34	433,127.91	11,377.25
Deposits with Agencies for Bond Coupons.....	346,629.87	4,175.00	348,339.87	1,710.00
Gas Bills Receivable.....	899,305.73	47,368.02	739,614.22	159,691.51
City of Chicago.....				
Cash.....	686,914.78	248,904.69	1,860,247.47	1,173,332.69
Central Trust Co.....				
Bills Receivable.....	99,227.35	5,000.00	68,242.32	30,985.03
Total Assets.....	\$76,866,058.86	\$919,352.69	\$78,713,918.21	\$1,847,859.35
LIABILITIES.				
Capital Stock.....	\$35,000,000.00		\$35,000,000.00	
Mortgage Bonds.....	34,496,000.00		35,096,000.00	\$600,000.00
Deposits, security for gas bills.....	102,238.15	\$17,525.65	131,188.14	28,949.99
Accounts Payable.....	351,634.03	16,558.82	360,335.10	8,701.07
Coupons past due.....	348,540.00	4,175.00	350,250.00	1,710.00
Bond Interest accrued.....	217,858.34		270,358.34	52,500.00
Profit and Loss.....	6,349,788.34	922,560.86	7,505,786.63	1,155,998.29
Bills Payable.....				
Depreciation and Reserves.....				
Total Liabilities.....	\$76,866,058.86	\$919,352.69	\$78,713,918.21	\$1,847,859.35

CONDENSED BALANCE SHEETS.

1898-1910.

ASSETS.	1905.	Increase or Decrease.	1906.	Increase or Decrease.
Real Estate, Franchise, Tunnels, Street Mains, Meters, Services, etc.....	\$73,610,954.81	\$1,422,191.87	\$74,578,523.67	\$967,568.86
Materials.....	984,946.61	153,044.66	911,730.74	73,215.87
Securities.....	2,243,681.53		2,243,681.53	
Accounts Receivable.....	412,516.21	20,611.70	640,633.87	228,117.66
Deposits with Agencies for Bond Coupons.....	292,154.87	56,185.00	291,469.87	685.00
Gas Bills Receivable.....	802,632.87	63,018.65	729,742.75	72,890.12
City of Chicago.....				
Cash.....	1,609,327.45	250,920.02	1,322,663.94	286,663.51
Central Trust Co.....				
Bills Receivable.....	62,727.35	5,514.97	34,227.35	28,500.00
Total Assets.....	\$80,018,941.70	\$1,305,023.49	\$80,752,673.72	\$733,732.02
LIABILITIES.				
Capital Stock.....	\$35,000,000.00		\$35,000,000.00	
Mortgage Bonds.....	35,096,000.00		35,096,000.00	
Deposits, security for gas bills.....	161,501.96	\$30,313.82	184,928.10	\$23,426.14
Accounts Payable.....	486,752.28	126,417.18	554,557.43	67,805.15
Coupons past due.....	294,065.00	56,185.00	293,380.00	685.00
Bond Interest accrued.....	303,691.67	33,333.33	304,111.67	420.00
Profit and Loss.....	8,676,930.79	1,171,144.16	9,319,696.52	642,765.73
Bills Payable.....				
Depreciation and Reserves.....				
Total Liabilities.....	\$80,018,941.70	\$1,305,023.49	\$80,752,673.72	\$733,732.02

CONDENSED BALANCE SHEETS.

1898-1910.

ASSETS.	1907.	Increase or Decrease.	1908.	Increase or Decrease.
Real Estate, Franchise, Tunnels, Street Mains, Meters, Services, etc.	\$75,177,227.34	\$598,703.67	\$76,236,321.47	\$1,059,094.13
Materials.....	1,493,276.21	581,545.47	1,478,480.51	14,795.70
Securities.....	2,242,403.40	1,278.13	2,226,403.40	16,000.00
Accounts Receivable.....	600,565.79	40,068.08	874,554.15	273,988.36
Deposits with Agencies for Bond Coupons.....	278,955.00	12,514.87	284,005.00	5,050.00
Gas Bills Receivable.....	867,132.12	137,389.37	893,850.71	26,718.59
City of Chicago.....	987,904.51	334,699.43	3,207,644.15	2,219,679.64
Cash.....	77,227.35	43,000.00	77,227.35	
Central Trust Co.....				
Bills Receivable.....				
Total Assets.....	\$81,724,751.72	\$972,078.00	\$85,278,486.74	\$3,553,735.02
LIABILITIES.				
Capital Stock.....	\$35,000,000.00		\$35,000,000.00	
Mortgage Bonds.....	35,096,000.00		37,096,000.00	\$2,000,000.00
Deposits, security for gas bills.....	246,324.19	\$ 61,396.09	273,760.19	27,436.00
Accounts Payable.....	936,947.71	382,390.28	927,598.49	9,349.22
Coupons past due.....	278,955.00	14,425.00	284,005.00	5,050.00
Bond Interest accrued.....	306,191.67	2,080.00	339,525.00	33,333.33
Profit and Loss.....	9,860,333.15	540,636.63	10,637,881.38	777,548.23
Bills Payable.....				
Depreciation and Reserves.....			719,716.68	719,716.68
Total Liabilities.....	\$81,724,751.72	\$972,078.00	\$85,278,486.74	\$3,553,735.02

CONDENSED BALANCE SHEETS.

1898-1910.

21



ASSETS.	1909.	Increase or Decrease.	1910.	Increase or Decrease.
Real Estate, Franchise, Tunnels, Street Mains, Meters, Services, etc.....	\$79,086,611.30	\$2,850,289.83	\$82,699,337.78	\$3,612,726.48
Materials.....	1,433,647.62	44,332.89	1,468,113.05	34,465.43
Securities.....	200,711.34	2,025,692.06	128,458.83	72,252.51
Accounts Receivable.....	1,320,434.07	445,879.92	1,010,086.79	310,347.28
Deposits with Agencies for Bond Coupons.....	286,735.00	2,730.00	295,155.00	8,420.00
Gas Bills Receivable.....	922,564.55	28,713.84	990,993.45	68,428.90
City of Chicago.....	3,546,427.92	338,783.77	4,819,934.05	1,273,506.13
Cash.....	52,227.35	25,000.00	52,227.35	
Central Trust Co.....				
Bills Receivable.....				
Total Assets.....	\$86,849,359.15	\$1,570,872.41	\$91,404,306.30	\$4,614,947.15
LIABILITIES.				
Capital Stock.....	\$35,000,000.00		\$35,000,000.00	
Mortgage Bonds.....	37,096,000.00		40,096,000.00	\$3,000,000.00
Deposits, security for gas bills.....	265,836.75	\$ 7,923.44	259,614.60	6,222.15
Accounts Payable.....	921,546.56	6,051.93	1,271,535.88	349,989.32
Coupons past due.....	286,735.00	2,730.00	295,155.00	8,420.00
Bond Interest accrued.....	339,525.00		389,525.00	50,000.00
Profit and Loss.....	11,418,948.39	781,067.01	12,123,280.40	704,332.01
Bills Payable.....	1,520,767.45	801,050.77	2,029,195.42	508,427.97
Depreciation and Reserves.....				
Total Liabilities.....	\$86,849,359.15	\$1,570,872.41	\$91,404,306.30	\$4,614,947.15

PLANT STATISTICS.

1898-1910.

Year.	Street Mains, Miles.	Meters.	Gas Stoves.	Public Lamps.	Arc Lamps.
1898.....	1,584.5	230,293	20,343	28,023	.....
1899.....	1,705.7	274,604	47,639	25,121	.....
1900.....	1,729.0	300,077	66,845	24,980	.....
1901.....	1,796.6	323,089	83,771	24,911	.....
1902.....	1,866.7	342,150	105,844	25,090	.....
1903.....	1,871.6	347,750	125,181	24,948	28,477
1904.....	1,939.5	359,327	147,222	24,974	33,337
1905.....	2,028.6	376,051	170,925	24,608	39,448
1906.....	2,103.1	392,397	197,619	23,673	45,714
1907.....	2,311.7	446,723	229,194	22,643	60,822
1908.....	2,366.4	469,084	254,362	21,085	75,025
1909.....	2,484.3	496,615	279,080	17,630	84,335
1910.....	2,568.9	522,536	305,279	18,060	87,261

VALUATION OF PROPERTY.

METHODS PURSUED.

The valuation upon which a gas utility is entitled to a reasonable rate of return, consistent with the risks inherent in the business, is the fair present value of the property used and useful in the production, distribution and sale of gas. This value consists of two principal divisions, namely: the physical plant and the intangible or going value of the plant. The former value embraces the land and buildings of the company, distribution mains, services and meters, gas holders, houses and vehicles, stores on hand and the allowance for working capital. The going value of the plant exists by virtue of the plant being a live, operating unit, supplying gas to those customers who have been induced to subscribe to the service, thus giving to the company an established income, in the development of which large expenditures have been made in one form or another by the investor and doubtless numerous losses sustained. Together, they constitute the legitimate and honest investment of the stockholder and represent the amount on which he is entitled to a reasonable return.

To arrive at the value of the property several methods are possible, any one of which may be satisfactory or unsatisfactory, depending upon the condition of the construction records of the company and the conditions under which the plant was constructed and the business developed. The value of the plant for the purpose of rate adjustment can not be computed from the cost records alone. It must be determined from a consideration of all the elements making for value, of which the principal ones are the original cost of the plant, its reproduction cost new as of to-day, its reproduction cost new less depreciation to show the fair pres-

ent value, the cost of developing the business, the amount of outstanding securities and the earning capacity of the plant. No formula or mathematical rule can be blindly followed, but from all the facts and elements of value it is necessary to apply a reasonable judgment to the end that substantial justice shall be done to both the public and the investor.

In this instance the methods of arriving at the value of the plant have been restricted by conditions over which neither the city nor the company had entire control. The present property, as already outlined, is a consolidation of several competing plants, the records of which are not available to-day. Many of the books and records of the merged companies were never turned over to the consolidated company. Even if they were in its possession to-day the data could not be given the greatest consideration because of the conditions under which such plants were constructed. Several plants were poorly erected, with insufficient regard for the future wear and tear of the property and often represented unnecessary duplication of facilities. To attempt to analyze the construction account from the company's records to-day would therefore be impossible, both because of the incompleteness of the records and because abnormal charges have been made to this account which can not be considered as capital to-day. The value has therefore been arrived at by the appraisal of the property.

Ordinarily, in undertaking an appraisal the first step would be to make a complete detailed inventory of all the property of the company, to be followed by a study of the local conditions affecting the cost of such work, the age of each unit of equipment, the degree to which it has been maintained and its adaptability to the service required, together with the determination of the unit prices to be used, and finally, the application of such prices to the determined inventory. In the present case much of this work was not undertaken for the reason that a complete inventory in general carefully prepared was submitted by the company through its engineers. The inventory was submitted in the following groups: (1) detailed description of each important building and unit of apparatus; (2) tabulations of the size and mileage of mains; (3) the number and size of meters and services in use; and (4) field books which contain the miscellaneous items, such as cast and wrought iron piping, tools, fences, docks, walks, paving about the plant and sundry small items. The cost of reproduction for each of the items mentioned was included with the inventory, which was sufficiently detailed to enable the unit quantities to be checked. This was particularly the case as regards buildings and foundations. Exhibits were also available showing the method of arriving at the cost of the various parts of the distribution system. While the inventory made unnecessary the detailed field work of checking and classifying every piece of property, it was not accepted without an inspection of all the plant and a check of the more

important items included in the exhibits in order to prove their correctness.

APPRAISAL.

The value of the land owned by the company was obtained from an appraisal of this property made by the valuation committee of the Chicago Real Estate Board. This appraisal was submitted by the company as its estimate of the land value. The classification was checked against the land occupied by the company and which it was reported to own. The reasonableness of the appraisal was verified by comparing the amounts with the prices paid for land in the neighborhood of the parcel under consideration. The values so furnished were accepted as representing the best evidence available.

The company's detailed building inventory was checked item for item in making the appraisal of this portion of the property. Building plans on file with the company were examined before any inspection of the premises was undertaken and important dimensions were checked. Where the building plans were not available it was necessary to secure all the information by visits to the structures in question. In addition to checking the quantities, the inspection work also covered a general examination in order to determine the specifications for all materials, the character of the maintenance and such additional matters as would affect either the cost of construction or the present value. The depth of underground foundations was taken from the plans and from the statements of superintendents, and in each case it was determined whether it was in keeping with common practice for similar soil conditions. The unit prices applied to the quantities found were compared with the company's own records covering the construction in question. Local contractors, including some who had performed a large portion of the company's work and who were familiar with present conditions in this city and vicinity, were interviewed as to the cost of labor and material. The prices used in each case covered the actual cost of the work, plus a fair contractor's profit. Where it had been necessary to remove dirt from the premises, the excavation cost was made sufficiently high to cover such expenses. The value of the new office building just completed for the company was taken from the company's books.

To prove the inventory submitted for the machinery and apparatus each station was visited by machinery and building inspectors, separate forms were prepared upon which were classified the various units of apparatus reported by the company and their correctness as to type, age, workmanship and per cent of condition noted. Where the inventory was insufficient additional information was secured in this manner. Besides checking the items contained in the inventory, these inspections embraced a general survey of each station, particularly with a view of

ascertaining the probable accuracy of the numerous items included in the field books. While the machinery was examined with the same detail as would have been followed had no inventory been available, it was much simplified by the coöperation of the company in this manner, since the apparatus was listed and it was necessary only to verify the inventory and to record information not contained therein. In certain instances discrepancies were disclosed between the inventory description and the apparatus as found which were adjusted in conferences with the engineers of the company.

In arriving at the unit prices to be used an effort was made to have the figures represent present conditions in the city of Chicago. Prices for iron and steel, cast iron pipe, labor and all other items entering into the cost of construction fluctuate from year to year with the condition of business, as is reflected in the cycles of industrial activity and depression. Because of these conditions it was necessary to use average prices, since to use either the highest or lowest prices during the last five years would be equally unfair. In comparing such prices with those actually paid by the company it was observed that because of its very large requirements each year and the facilities and skill of its officers in the making of purchases it was able to secure contracts at substantial concessions from the prevailing market prices. The position of the company in this respect is typical of large industries generally. It is well known that there is considerable difference in the ability of companies to purchase at low figures. As a rule, the larger companies are able to purchase more favorably than the smaller ones because of their larger requirements and also because of more favorable market and shipping facilities in large cities. There are, however, obstacles which tend to increase costs due to the higher wage scales prevailing in large cities and the additional costs incurred in construction work because of the congested traffic conditions in the streets. In this instance, however, there can be no question but what the company is securing prices on contracts which on the whole compare very favorably with the general market. It is therefore evident that local conditions and the particular facilities of the company in question must be given full consideration in determining the proper units to apply in the appraisal of a given property.

In general, the benefits of favorable purchase of operating supplies and material for construction purposes belong to the investor. To deprive him of the benefits due to skill in management and operation would be to destroy every incentive for economy and efficiency. It does not follow, however, that every economy is to be credited to the company, for the public is entitled to the benefit of that degree of intelligence and technical skill which can reasonably be expected of men entrusted with responsibilities of administering a property so large as the plant in question. The best evidence of reasonable prices to be used

for this purpose was therefore to be found in the records of the company itself. Wherever possible, examination was made of the company's contracts and vouchers to determine how favorably its purchases were made, and from such records averages were taken. For this purpose a large number of contracts was submitted by the company for cost analysis. Prices which departed materially from the average, or were at great variance with the market, were submitted to the officials of the company for additional information and explanation. Wherever it appeared that a contract was placed at a price in excess of what was reasonably to be expected under the circumstances, the amount was reduced. In those instances where it appeared that the company secured an extraordinary bargain, the benefits of such saving were allowed to the company and only those prices were used which appeared reasonable and just. In the figures as finally adopted the average embraced many instances where the unit costs as shown by the company's own records were slightly increased.

In placing values on specific apparatus various features were considered. In general machinery of the same capacity varies greatly in price, due to the quality of the material, the character of workmanship, the type of construction, the use of patented devices and other features. The unfairness of using a single unit price for all machinery of the same capacity was at once apparent. In the present appraisal an effort was made to give careful consideration to every feature, and the more important units of equipment were appraised only after additional information had been secured. Where such machinery was installed under contract, the detailed costs thereof were easily analyzed. Where the installation was made by the company itself an addition was made covering the costs which would reasonably be incurred in the proper placing of the equipment under normal conditions.

It was found that during the last few years several classes of machinery, particularly water gas generators, had been built by the company for its own use. The actual cost of construction in each case was obtained and was found to be much below the price for which such equipment could be purchased in the open market. The prices for units of substantially the same character were obtained from the various manufacturers for comparison with the costs as shown in the company's records. In placing the value on this equipment for the purpose of this appraisal the figures used contained an addition of what was believed to be a fair allowance for burden and profit to the actual cost of the apparatus. In this manner the economies of construction due to the peculiar facilities developed by the company were credited to the company, for it was believed that the public was entitled to no better price than the most favorable price which the market provided for a unit of similar capacity and efficiency.

Considerable difficulty was encountered in determining the reasonableness of the value placed upon the items included in the field books. They constituted an unclassified mass of unlike items, ranging in value from a few cents to thousands of dollars. To properly arrive at what constituted a fair value for this property it was necessary to classify the many items into fourteen separate groups and to apply the proper units in each case. The prices of most of the classes of property as submitted by the company were found to be substantially correct. The same was true with regard to the allowance for labor wherever this entered as an element of cost, although in a few instances revisions were found necessary. The value of such large items as docks, tracks, paying and side-walks at stations, fences, etc., were revised where specific instances showed such to be necessary. In a number of cases the company's basis of estimating the value of the work in question was not accepted and additional information was secured from the general officers. Numerous conferences were held in which the differences were thoroughly discussed and in most instances a conclusion was arrived at which was accepted as substantially correct.

In the appraisal of the company's holders the method used was similar to that used in valuing the machinery and apparatus. Equipment of this character can not be valued on a cost per unit or capacity basis without detailed information concerning the type of the apparatus and the conditions surrounding its construction. In this instance it was necessary to secure all the information which was afforded by the specifications covering the foundation work and the erection of the steel work. The masonry work was estimated on the basis of present prices for concrete, brick work, excavation and piling, and the values arrived at were in general somewhat above the contract prices. Detailed estimates of weight for holders of various types of construction were made. In arriving at the final values, full consideration was given to market prices and the type of construction in each instance. The large holders were valued on what amounted substantially to a pound-price basis.

In appraising the distribution system different methods were necessary. Owing to the fact that the mains and services could not be inspected, it was necessary to resort to the records of the company. These records consisted of maps and atlases drawn carefully to scale and showing the proper location of the mains, valves, drips and specials. The atlases of the company are drawn to a scale of 100 feet to the inch. This scale was carefully verified and found to be correct. All such maps were scaled and each run of pipe located and the points between which it was laid, together with the size of the pipe and the date when laid, were noted. This record was summarized to show the different sizes of pipe and the amount of each size, and also the amount of pipe laid during each year. The total length of pipe as scaled from the company's records was

somewhat less than the total as arrived at from the records of the consolidated companies, but agreed substantially with the company's own scaling of the atlases. These maps were prepared by the company since the consolidation in 1897 and have been corrected wherever errors and omissions were found. They have been tested by making excavations at various points, and it is believed they constitute the best record of the extent of the distribution system. As a test of the accuracy with which the scaling from these records could be done, the 24-inch main laid during the last two years was totaled from the original work orders and scaled, the amount so obtained agreeing with the record length within two-tenths of one per cent.

In arriving at the present unit costs to be applied in the distribution system, it was decided to use the company's records of actual expenditures for a number of years, believing that these costs most nearly represent the cost of such work to-day under the conditions which prevail in this city. With this in view, the various individual construction undertakings shown by the atlases to have been made within the last ten years were analyzed and the original work orders which are used in the regular course of business by the company were secured. This analysis did not include all the pipe laid during these years, because in a number of cases the construction work as entered on the record did not show the date when the work was performed. The analysis, however, did include construction work on all sizes of pipe between four inches and thirty inches in diameter, and may be regarded as representative of the cost of laying mains not only during these years, but as a fair unit cost for the present. These work orders showed in detail the amount of material used and the labor employed. The material included the pipe, specials, small fittings, lead, coal, blocking, etc. The labor was shown in the detailed statement in such form that it was possible to determine the expense for foremen and supervision, calkers and common labor. To secure this detailed information, it was, therefore, necessary to analyze and tabulate these work orders. Many hundred of such orders, including over three hundred six-inch pipe construction orders and all orders where other than six-inch pipe was laid, were analyzed in this manner. From the summary of all such tabulations it was found that the costs were substantially the same in the three districts in the city, i. e., the North Division, the West Division and the South Division. For this reason a single unit cost was used for the different classes of property throughout the city. In arriving at the total as thus used, full consideration was given to the relatively higher cost of construction work where small amounts were involved. The cost of four-inch pipe and thirty-inch pipe appeared abnormal, due to the fact that so small an amount of pipe of these sizes was laid. Since the work orders did not contain any provision for the use of tools and teams, it was necessary to make adjustments for this

purpose. The work orders did include the cost incurred in disturbing paving where this was done, but did not include the cost of repaving. Every effort was made to have the final units agree, in so far as appeared just, with the actual construction costs as shown by the company's records and conditions known to exist at present.

The most important item of material in the distribution system is the main pipe. Cast-iron pipe varies widely in price at different times of the year, and also from year to year. It being the object in this appraisal to use prices which are representative of present conditions, and which it is believed could be secured in the reproduction of an enterprise on a scale of the property in question, it seemed advisable to use a unit which would be an average price over a number of years. It is a matter of common knowledge and substantiated by the records of the company, that the largest purchases of pipe are not made at a time when prices are the highest. As a rule, purchases are made on a more liberal scale when prices are low, at which time contracts are entered into covering the requirements for a considerable period of time, deliveries being made as called for. In fixing the price for this pipe the company's contracts for cast-iron pipe from 1901 to 1910 were tabulated. The variation in price ranged from \$22 to over \$34 per ton. Since a comparatively small amount of pipe was laid when the price was at the highest, it would appear unfair to use an average of these two figures. A weighted average was, therefore, used which was secured by multiplying the contract price for each year by the number of tons purchased at the particular price as shown by the contract. The total of such figures was the total amount of pipe purchased and the total prices paid, from which was computed the proper average price of \$26.10 per ton. Due to the differential which usually exists between the large and small sizes of pipe an allowance was made of \$1 additional, so that the average cost of \$26.10 per ton was used for six-inch pipe and larger sizes, while \$27.10 per ton was used for four-inch pipe. Since these prices did not include the cost of teaming nor the use of tools, adjustments were necessary and a percentage computed from the company's records was allowed to cover these expenditures.

The method of arriving at the cost of services was similar to that described in regard to mains. It was, however, impracticable to secure all the original work orders, but instead a recapitulation of these work orders was used which had been compiled from year to year by the company in the regular course of its business. These summaries were kept with much detail prior to 1904, since which date much less information is contained in the records. A careful analysis was made of all the records in possession of the company for the period from 1900 to 1904 covering one and a half inch service pipes, which is the size of the greatest number of services. By making comparisons it was found that the cost of labor per service was substantially the same in recent years as it was in the

years immediately preceding 1904. The price to be allowed for the service piping was the same as that used by the company for wrought-iron pipe at the station, to which cost was added $11\frac{1}{2}$ cents per foot to cover the cost of preparing pipe with protective coatings. It was also necessary to adjust the average price used for fittings because it was found that certain services were installed without a curb box and cock. From all the data which could be obtained and the tabulations based upon the records, it was decided that \$1 for fittings represented a fair average for one and a half inch services and those of smaller size. The larger services were allowed curb box and cock, the cost of which was taken from the summarized cost of the services. The labor cost on the larger services varied greatly, with the result that the average cost was uncertain. Special attention was directed to the irregularity shown in the analysis of these larger services, and the resulting figure arrived at is believed to be fair to the company and to the public. The amount involved in connection with the larger services is comparatively small and could not appreciably affect the result. The service pipes when finally installed consist of a number of small articles which are handled through storehouses, making it necessary to add a reasonable charge for warehouse and storage service and also a charge covering the cost of tools.

The value of meters and meter connections in this appraisal is based on the present actual cost to the company. Here again it was necessary to add to the bare cost a percentage covering storeroom charges and a small additional charge to cover the handling and first test of the meter. The cost of the original installation was graded proportionally to the size of the meters, and the average cost per meter represents the average cost of installation during the last two years, which cost is accepted as most nearly representing present costs.

The company's value for house governors was accepted. There are in the streets a number of vaults which contain district governors used in connection with the booster system. The work orders for 54 out of a total of 58 of these vaults were secured and used as a basis for the cost of material and labor in placing governors in vaults. To the final cost in this case there was also added an allowance for the use of tools. The value of the masonry work in the construction of the vaults was taken from the contracts covering their construction. There are at present seven tunnels under the river owned by the company. To arrive at what represents a fair price, information in addition to that possessed by the company was sought from parties acquainted with work of this character, and the unit costs for the different materials and classes of labor were obtained from this analysis and investigation.

The miscellaneous classes of property representing minor items in the inventory and valuation were accepted after investigation as being substantially correct and were so entered in the detailed tables.

INDIRECT OR OVERHEAD CONSTRUCTION CHARGES.

The different classified values above referred to embrace only the costs of labor and material, or the direct costs. There must be added to the cost of each item of equipment, or to the value of the sum of all such items, a certain amount to cover the indirect or overhead cost. This cost is made up of a number of items of which the most important are legal and organization expenses, engineering and supervision, interest during construction, fire and liability insurance during construction, taxes, if the period of construction is of considerable length, and an allowance for hazards and contingencies during construction. While all agree that allowance must be made for overhead expense for each of the items enumerated, much difference of opinion exists as regards the amount to be allowed. Although the valuation of the property is to be determined largely on the theory of reproduction cost, it does not necessarily follow that these costs should be determined upon a basis more or less hypothetical, but, on the contrary, that consideration should also be given to the actual costs incurred in constructing the plant in question. The records of the company are the best evidence as to what such overhead expenses should be, and full weight has, therefore, been given to the cost shown for expenditures of this character for a number of the items during the last few years. The figures used are based on the theory of the plant being constructed over a number of years, or what is generally called the piecemeal- construction plan. If all the overhead charges were based on the company's records for recent years the amount would clearly be too small. It is, therefore, assumed for the determination of this question that the plant will be reproduced over a period of approximately ten years, but it does not seem reasonable that the same units of cost which are incurred in the construction of the first half, or the first third of the plant, should be used for the entire plant. In arriving at a fair overhead charge, the assumed years of construction have been divided into three periods and the items of expense increased or reduced as shown to be justified from actual construction records and the history of the plant in question.

It is safe to assume for the purpose of this appraisal that the first third of the plant was constructed under the least favorable conditions. The credit of the company being low at this time, the addition for interest was placed at 6 per cent. It is known that the bonds issued for the first construction expenses were sold at substantial concessions. The interest charges would not apply for the full period since as soon as any part of the plant was completed it would be put into operation. Further, construction work could be carried on only during about six or eight months of the year, so that the time for which the interest must be paid would be considerably less than the full period during which the first

third of the construction was completed. Engineering expense during this period is placed at 5 per cent, which is the usual charge for work of this character. Organization and legal expenses would be highest during the first period, during which time the company would be incorporated and its various contracts subject to examination and titles to property verified. It would seem that 3 per cent is a reasonable additional allowance for this purpose. One per cent is allowed for taxes. In addition to the above charges there is added 7 per cent for contingencies, hazards and omissions, making a total overhead charge of 22 per cent for the first third of the property.

During the second period of the company's construction work considerable progress would have been made and the management of the company would have reached an efficient stage. Additions for interest charges on construction during this period have been placed at 5 per cent and the organization expense at 2 per cent. Engineering expense, it is assumed, will require a 5 per cent charge, since the construction of the plant was proceeding on a very large scale and at a rapid pace. With the perfection of the organization and the development generally of the plant, it is believed that the allowance for contingencies should not be as large as during the earliest period, and 5 per cent is added for this purpose. The foregoing allowances provide a total overhead charge of 17 per cent on what represents the second or middle period of construction work.

During the third of the assumed periods it is believed that substantial economies can be secured which should be shared with the public. To provide the same high indirect charges for this period of construction as were provided for the first period would be contrary to established practice and must result in excessive overhead charges. It is an established fact that the engineering service at this stage of development was performed chiefly by the company's own staff, part of whose services were engaged for the benefit of the operating department, so that the cost thereof should be distributed over operation and construction. This is true of every large utility construction work. An addition of 4 per cent for engineering and superintendence is deemed reasonable. With the large development of business which the company has secured by this time and the practical monopoly which it possesses of the gas business, it is natural that a relatively higher credit will have been established and that money can be secured at a lower rate. An allowance of 3 per cent is added for this purpose. Organization expenses during this period will be very much reduced and consist only of the examination of contracts and titles involved in transactions connected with the extension of the plant, which requirements should not exceed one per cent. Contingencies are provided for in an additional allowance of 4 per cent. These additions are equivalent to 12 per cent of the direct costs during the last

third of the total plant construction. The allowance for overhead or indirect charges on the total property is, therefore, equivalent to the average of the rate applied during each of the three assumed periods of construction, or an average of 17 per cent. This addition is included in the tables showing the plant valuation.

It would seem that 17 per cent is an unreasonable overhead charge to add to the value of the land, since engineering expense is not incurred to as great an extent as in the construction of the plant as a whole, nor does the item of contingencies materially affect the cost of the land. The interest charge, however, should be somewhat larger than that for the construction work, since the purchase of land represents probably the first investment. Instead of 17 per cent, it is believed that 12 per cent is more nearly correct, which amount has been used in this appraisal. This allowance appears especially fair since this percentage is applied to the present value of the land instead of to the smaller amount representing the original investment.

In judging the fairness of the above overhead charges it must be borne in mind that the unit costs used in this appraisal are based upon the piece-meal construction of the property as determined from the company's records, and further, that certain portions of the property now in service were constructed under contracts which included some provision for engineering and superintendence, together with a part of the contingency expense. Since the unit prices were obtained largely from the company's records, the amounts used, therefore, include some provision for overhead charges. This, in general, is true with respect to the cost of the buildings, holders and such apparatus as purifiers, condensers and scrubbers. The addition, therefore, of 17 per cent to these costs for overhead expenses must be accepted as fair.

DISCOUNTS.

Closely allied to the subject of overhead charges, but differing in several particulars, is the additional construction charge due to discounts on bonds. In other words, provision must be made in the appraisal for the cost of the funds with which to finance the undertaking. Not to allow any sum in this valuation for discounts on bonds issued for construction purposes would be equivalent to assuming that a sum of money as large as is required to construct a plant of the magnitude of that under investigation could be obtained for investment in a somewhat hazardous undertaking without any price for such funds. It would be equivalent to assuming that capital seeks such investments without inducement, being willing to incur the risks of the industry in return for no more than a reasonable profit. The financing of corporations in the past and at the present time clearly shows that securities bearing a fair rate of interest can rarely be sold at a price netting par to the corporation.

The amount of the discount on securities is determined by a number of factors, chief of which are the credit position of the company, the interest rate which the bond bears, the condition of the money market and the life of the bond. Naturally, the company whose business is firmly established and whose record has been a prosperous one can dispose of its construction bonds at a comparatively low discount, while a new company, untried in its field and whose business is yet in an uncertain stage of development, must pay a heavy discount if it would dispose of its issues at all. Discriminating investors find little to encourage them in paying par for an issue of uncertain merit. The security which it is sought to dispose of must compete for favor with all other investment issues in the open competitive money market and the discount there exacted must be regarded as a cost of securing the funds, just as additional charges are incurred over and above the bare construction cost in securing the physical plant. There is no escape from this conclusion, especially when the bonds can not be sold on any other terms. It may be possible to escape the discount by paying a sufficiently high interest rate to attract capital, but such a step would mean a heavy burden on the earnings throughout the entire life of the bonds.

Under normal conditions the discount on bonds is almost inevitable. The amount of such discount may be charged to capital or to operating expenses. Where the utility can not be constructed at the time when the public demands the service to be furnished, except through the sale of its securities at a discount, such discount creates a charge which the public should bear as the cost of securing the service at such time. If the construction work had been postponed until the money market was more favorable or until the city had grown to a point where the success of the industry was made more certain, the public would have been deprived during such period of the benefits which the company was to furnish. To supply a large amount of money at a particular time entails heavy expenses. These charges must be met by some party. The company can not escape paying the amount of the discount at some future date, and its financial program must be shaped with this end in view. If operating expenses are to be charged with the discount the company must be very prosperous in order to have sufficient margin over its current charges and the fixed expenses on prior issues of securities. It would also mean that the cost of securing the utility through this method would be paid for by those who used the service during the early years of development. To charge the discount to construction means that until amortized through sinking-fund operations the customers throughout the life of the bond are gradually meeting this charge. Under certain conditions discounts should be wiped out through the surplus account or a suspense account, but under financial conditions most frequently encountered they

must be considered as a cost of construction, and in this disposition officials of the company have practically little choice.

If the discount is to be charged to construction, and this would seem to be proper, especially where it is known that most of the securities of this company were put out at a substantial concession, it becomes a problem to determine the amount of such allowance. Clearly the discount would be highest during the early years of development, and much reduced when the success of the plant and its earning capacity is established. Under normal conditions, such discounts range from 5 to 20 per cent as affected by the facts in each particular case.

It is known that some of the bonds issued for construction purposes by this company, and bearing interest at the rate of 6 per cent, sold at a price as low as 80, or at a discount of 20 per cent. The most recent issue of bonds sold at a price fractionally under par. In most instances, prior to 1897, the discount was in excess of 10 per cent. In arriving at an amount which fairly represents the discount charge to be allowed here, consideration has been given both to the price for which the different issues have been sold or cost of construction theory, and to what would be a reasonable discount to-day under the cost of reproduction theory. The former was entirely a matter of record. The latter was determined from interviews with those familiar with the sale of securities and a study of the investment market. From both the weighted average of the discounts on the bonds issued since the consolidation in 1897 and the probable discount on the securities if the plant were reconstructed to-day, it is believed that an allowance of 6 per cent for this expense is reasonable.

APPORTIONMENT OF PROPERTY.

Not all of the property owned by the company is being used in the manufacture, distribution and sale of gas to the people of Chicago. Aside from the investment in land, buildings, apparatus, holders and distribution system used directly for this purpose, considerable property is used exclusively for the distribution of natural gas, a separate service which the company is furnishing under a franchise of one of the companies embraced in the consolidation of 1897. The company also owns some real estate which it acquired in the settlement of obligations due to it, which property is now being rented. Certain of the old manufacturing stations acquired in 1897 have since become unserviceable and a part of one of them has been rented to the Pintsch Gas Company, which manufactures gas for car-lighting purposes, while a portion of another plant has been rented to a manufacturing company. The company is also the owner of a large modern office building, only a part of which is used for its own purpose. Apportionments have been made of all the property so as to determine what amount is used and useful in the manufactured gas serv-

ice and the natural gas service and what amount is to be considered as commercial property. The separation between the manufactured gas property and the natural gas property has been made to enable a cost analysis for each service.

The tables below show the classification of the physical property and the additions to the direct costs representing the overhead or indirect charges and also the discount on the securities represented by the amount of the plant cost. The property has been classified so as to show both the cost new and the present value of the investment in the manufacturing stations, distribution system and the miscellaneous equipment, with the subdivision of the property above referred to showing the investment in manufactured gas property, natural gas property and commercial property.

UTILITY OPERATIVE PROPERTY.
MANUFACTURED GAS—STATIONS.

STATION.	Land.		Buildings and Structures.		Equipment.		Holders.		Total.	
	Cost.	Present Value.	Cost New.	Present Value.	Cost New.	Present Value.	Cost New.	Present Value.	Cost New.	Present Value.
Division Street.....	\$ 757,682	\$ 757,682	\$227,743	\$157,160	\$694,563	\$ 573,040	\$338,000	\$254,235	\$ 2,017,988	\$1,742,117
North.....	334,820	334,820	224,727	136,863	634,932	501,438	170,200	103,005	1,364,679	1,076,126
Twenty-Second Street.....	366,951	366,951	174,053	130,746	540,717	442,609	345,000	278,052	1,426,721	1,218,358
South.....	263,569	263,569	176,213	115,230	491,679	386,183	377,800	333,954	1,309,261	1,098,936
Ninety-six Street.....	25,688	25,688	45,846	32,129	167,151	136,484	52,000	42,842	290,685	237,143
Consumers.....	76,543	76,543	114,356	74,727	201,778	143,465	140,000	94,724	622,677	389,459
110th Street.....	8,130	8,130	22,584	17,737	117,869	111,162	59,800	58,123	208,383	195,152
Hawthorne.....	81,977	81,977	18,689	16,734	69,586	58,189	320,000	308,000	490,252	464,900
Main Street.....	196,903	196,903	54,579	49,635	112,217	102,049	615,000	554,170	978,699	902,757
Thirty-first Street.....	53,942	53,942	47,038	44,545	145,955	133,422	257,500	161,810	504,435	393,719
Forty-fifth Avenue.....	31,395	31,395	35,838	33,836	55,779	50,197	320,000	317,000	443,012	432,428
Ninety-sixth St. Holder.....	29,886	29,886	24,306	24,093	52,664	47,023	325,000	321,950	431,856	422,952
Sixty-fourth St. Holder.....	57,950	57,950	28,608	27,438	112,220	108,767	320,000	314,000	518,778	508,155
Archer Avenue.....	23,178	23,178	.....	.....	.....	.....	126,000	93,968	149,178	117,146
Equitable.....	26,352	26,352	13,443	8,872	9,100	6,825	.....	.....	48,895	42,049
West Shop.....	.....	.....	59,870	48,060	15,022	12,251	.....	.....	74,892	60,311
North Shop.....	18,336	18,336	26,121	15,714	8,124	6,075	.....	.....	52,581	40,125
Machine Shop.....	18,750	18,750	12,932	7,987	17,487	9,340	.....	.....	49,169	36,077
Sixty-fourth St. Shop.....	52,185	52,185	108,571	101,333	20,894	16,446	.....	.....	181,650	169,964
Branch Stores and Shops.....	.....	.....	.....	.....	4,951	3,750	.....	.....	4,951	3,750
4010 Wabash Avenue.....	3,000	3,000	11,773	9,036	7,380	6,056	.....	.....	22,153	18,092
New Works.....	770,732	770,732	.....	.....	.....	.....	.....	.....	770,732	770,732
North 47th St. Holder.....	46,796	46,796	.....	.....	.....	.....	.....	.....	46,796	46,796
Bowen Avenue.....	13,200	13,200	2,500	1,750	.....	.....	.....	.....	15,700	14,950
Total.....	\$3,257,965	\$3,257,965	\$1,429,790	\$1,053,625	\$3,570,068	\$2,854,771	\$3,766,300	\$3,235,833	\$12,024,123	\$10,402,194

NATURAL GAS—STATIONS.

STATION.	Land.		Buildings and Structures.		Equipment.		Holders.		Total.	
	Cost.	Present Value.	Cost New.	Present Value.	Cost New.	Present Value.	Cost New.	Present Value.	Cost New.	Present Value.
106th Street.....	\$2,608	\$2,608	\$ 5,432	\$3,896	\$15,402	\$ 7,610	.....	.....	\$ 23,442	\$ 14,114
110th Street.....	4,378	4,378	12,161	9,550	63,468	59,856	32,200	31,297	112,207	105,081
4010 Wabash Avenue.....	.....	.....	.....	.....	1,924	983	.....	.....	1,924	983
Total.....	\$6,986	\$6,986	\$ 17,593	\$13,446	\$80,794	\$68,449	\$32,200	\$31,297	\$137,573	\$120,178

UTILITY OPERATIVE PROPERTY—Continued.
MANUFACTURED GAS.

	Cost New.	Present Value.
Distribution System:		
Mains (2,097.23 Miles).....	\$11,173,109	\$10,471,899
Meters.....	3,922,163	2,745,514
Services.....	4,532,487	2,932,117
Street Governors and Vaults	153,291	149,882
Tunnels.....	147,000	138,180
Total.....	\$19,928,050	\$16,437,592
Miscellaneous:		
Dwellings at 64th Street.....	\$ 33,928	\$ 23,750
Automobiles, Horses, Wagons, etc.....	112,589	95,701
Old Furniture.....	52,513	22,759
New Furniture.....	195,575	195,575
Total.....	\$374,605	\$337,785

NATURAL GAS.

Distribution System:		
Mains (250.90 Miles).....	\$1,637,026	\$1,496,022
Services.....	401,725	268,440
Meters.....	106,825	74,778
Total.....	\$2,145,576	\$1,839,240

NON-OPERATIVE PROPERTY.

Equitable:		
Land.....	\$131,760	
Buildings and Structures.....	60,307	
Holders.....	15,507	
Station Equipment.....	293,869	
Total.....		\$501,443
50th St. and Forrestville Ave.:		
Land.....	\$1,250	
Buildings and Miscellaneous Structures.....	800	
Station Equipment.....	1,460	
Total.....		\$3,510
Superior Street:		
Land.....		69,426
Green Street:		
Land.....		36,000
40th Street:		
Land.....		2,000
Town of Worth:		
Land.....		150
Total Non-operative Property (excluding office building).....		\$612,529

SUMMARY OF PHYSICAL VALUATION—1910.
UTILITY OPERATIVE PROPERTY.

ITEM	Manufactured Gas.		Natural Gas.		Total.
	Cost New.	Present Value.	Cost New.	Present Value.	
Land.....	\$ 3,257,965	\$3,257,965	\$ 6,986	\$ 6,986	\$ 3,264,951
Add 12% for Overhead.....	390,956	390,956	838	838	391,794
Buildings.....	1,429,790	1,053,625	17,593	13,446	1,447,383
Station Equipment.....	3,570,068	2,854,771	80,794	68,449	3,650,862
Holders.....	3,766,300	3,235,833	32,200	31,297	3,798,500
Distribution System.....	19,928,050	16,437,592	2,145,576	1,839,240	22,073,626
Miscellaneous.....	374,605	337,785	.....	.....	374,605
Sub-Total.....	\$29,068,813	\$23,919,606	2,276,163	1,952,432	25,872,038
Add 17% for Overhead.....	4,941,698	4,066,333	386,948	331,913	5,328,646
Total for all Items.....	\$37,659,432	\$31,634,860	2,670,935	2,292,169	40,330,367
Discount on Securities at 6%.....	2,259,566	1,898,092	160,256	137,530	2,419,822
Total Util. Oper. Property.....	\$39,918,998	\$33,533,952	2,831,191	2,429,699	42,750,189
NON-OPERATIVE PROPERTY*					
New Gas Building.....					\$4,817,162
Add 7% for Overhead.....					337,201
Land.....					240,586
Add 12% for Overhead.....					28,870
Buildings.....					61,107
Station Equipment.....					295,329
Holders.....					15,507
Distribution System (Dead Mains).....					50,981
Sub-Total.....					422,924
Add 17% for Overhead.....					71,897
Total for all Items.....					\$5,918,640
Discount on Securities at 6%.....					355,118
Total Non-operative Property.....					\$6,273,758
Grand Total of all Physical Property.....					\$49,023,947

*The Non-operative Property was not depreciated.

DEPRECIATION OF PROPERTY.

The difference between the reproduction cost new of the physical property and its present value is \$6,786,538, which represents the estimated depreciation through wear and tear and obsolescence. To offset this reduction in value, the company should have created a depreciation reserve to which should be credited annually an amount charged to operating expenses equal to the estimated depreciation of the plant during the year. The rate of return to which the investor is entitled should be applied on the fair present value of the property. If the property has depreciated, and no allowance has been made to restore the capital so consumed, the rate of return must apply on the depreciated value of the plant instead of on the cost new. If, as a matter of law, the present value of the plant is equal to the reproduction cost new, less depreciation, the present value of the investment should be enhanced by an amount which the company has set aside for the replacement of those units which have decreased in value through age and use. The company in this case has charged operating expenses annually with an amount which it deemed sufficient to offset the depreciation. These charges, although large in the aggregate, are not sufficient to equal the difference between the cost new and the present value. The reserve for depreciation on December 31, 1909, as shown by the company's books, was \$1,617,095. In some respects, the amount shown to the credit of such a specific reserve is largely a book-keeping transaction, the important consideration in each instance being whether the company actually possesses property which, if not set aside for specific depreciation purposes, could be set aside without doing violence to any other obligation. This is believed to be the situation here. The company has earned large sums during recent years which it might have set aside for depreciation had the officers so decided. Its earnings have exceeded, by a liberal margin, all necessary requirements, but instead of creating a reserve for depreciation sufficiently large to represent the estimated depreciation of the property, such surplus earnings have been placed to the credit of other accounts from which they may be transferred by book entry to the depreciation reserve when occasion requires. It is, therefore, assumed that the board of directors, being in a position to protect the assets of the company against wear and tear, will take such steps as will insure the maintenance of the physical investment by the use of any funds now available for that purpose, although not specifically set aside at this date for that use. Since such assets are ample in amount, the value of the physical property through the addition of these amounts is considered on the basis of its cost new.

WORKING CAPITAL.

Because of the nature of the gas industry the amount to be allowed for working capital can be determined with reasonable accuracy. Such

an allowance should embrace the cash requirements of the company for current use, together with the quick assets readily convertible into cash. The amount of working capital will vary with every industry, depending upon the frequency of collections, the amount of materials and supplies tied up in the process of manufacture at any one time, the amount of supplies which it is necessary to have on hand at all times, the probable cash demands on the company, etc. An analysis of the conditions affecting the industry in Chicago indicates clearly the more important elements governing the amount of working capital.

In this connection, it must be borne in mind that the company is operating a very large business which, aside from any conditions peculiar to the industry, requires a large working capital. Its pay-roll shows many thousand employees who are paid at frequent intervals. The operating expenses constitute a very large amount, and in addition to the regular requirements in every business, to which this is no exception, demands are constantly arising which can not reasonably be anticipated, and to meet these demands additional cash is required. To take advantage of favorable markets, the company must have available funds by means of which it can reduce both the charges to capital and the operating expense. It is desirable that all bills be promptly paid and that advantage be taken of all discount privileges. During the last few years the cash resources of the company have ranged from approximately \$1,000,000 to nearly \$3,000,000. From its experience during a number of years the company has found that it is inexpedient, and not without certain elements of danger, to permit the cash on hand to fall below \$1,000,000.

The amount of material and supplies on hand as shown by the inventory is very large and at first glance appears unreasonably so. These stores consist chiefly of coal, coke and oil. The daily requirements of the company are very heavy and to insure itself in the possession of sufficient material to permit the operation of the plant without interruption due to freight congestion, strikes and unfavorable weather, large stores are necessary. If no supply were carried to guard against such contingencies excessive prices would be demanded at a time when coal strikes, rail strikes or storms prevent the movement of certain supplies, while at certain times it would be difficult to obtain the necessary material at any price. These large stores are further made necessary because the sources from which the company receives its material are long distances from this city. Favorable contracts and the choice of rail and water routes for shipment reduce these requirements to some extent, but prudence dictates that stores approximately as large as those shown in the inventory be kept on hand.

Against these more or less unfavorable features requiring a large working capital are the advantages arising from the sale of gas and the absence of any violent fluctuations in the operating expenses and in-

ventory accounts. The amount of sales for each month is not subject to great variation and the company is therefore able to estimate with a considerable degree of accuracy the money which it will have at any time to meet current obligations. Under the present schedule of charges for gas a penalty of 10 cents per thousand cubic feet is charged in case of failure to pay bills promptly. The amount unpaid at the expiration of the discount periods rarely exceeds eight per cent. On these arrears the company receives a profit of 10 cents per thousand cubic feet. With the city divided into many districts so that all the customers' payments are not due at the same time, the cash is received in large volume each day and the necessity for temporary borrowing from this cause is reduced to a minimum. With respect to its collections the gas company is undoubtedly in a more favorable position than a commercial enterprise doing a business of the same proportion.

The stores account, the pay-roll requirements and the current assets of the company do not fluctuate through a very wide range. Whatever changes take place are largely seasonal and can be anticipated by the officers of the company. The following table shows the range of the gas stores account, accounts receivable and the pay-roll through a twelve-months period:

1910.	Gas Stores.	Acc'ts Receivable.	Pay Roll.
January.....	\$1,098,551.87	\$1,856,054.41	\$253,175.65
February.....	1,178,042.95	1,735,428.78	240,782.12
March.....	1,316,230.06	1,628,258.12	268,474.39
April.....	1,382,814.87	1,604,220.79	293,341.47
May.....	1,331,026.21	1,562,717.27	304,670.56
June.....	1,320,725.43	1,521,618.04	297,669.41
July.....	1,300,020.29	1,448,670.32	290,038.86
August.....	1,235,679.30	1,460,753.06	297,371.79
September.....	1,219,047.51	1,620,872.88	277,316.07
October.....	1,183,797.54	1,761,298.46	281,126.80
November.....	1,156,609.23	1,743,654.28	272,229.69
December.....	1,140,011.03	1,734,090.46	272,811.79

The best information as to what constitutes a reasonable allowance for working capital is supplied by the balance sheets showing the current assets and the current liabilities. In examining these statements it must be borne in mind that during the last three years the company has been engaged in very extensive construction work and has sold additional securities which shows in the material increase in the cash on hand. So much of the balance sheets as is material to the determination of the working capital is shown in the tabulation below for the last five years:

Current Assets:

Cash.....	\$1,322,664	\$ 987,965	\$3,207,644	\$3,546,428	\$4,819,934
Accounts receivable....	1,220,377	1,476,514	1,485,021	1,747,491	1,734,090
Gas Stores and Supplies.	832,398	1,384,791	1,142,873	1,071,247	1,140,011
Total.....	\$3,375,439	\$3,849,270	\$5,835,538	\$6,365,166	\$7,694,035
Current Liabilities	\$739,466	\$1,185,272	\$1,201,359	\$1,187,383	\$1,531,150

There is no fixed rule by which the amount of working capital can be computed. The range of maximum and minimum allowance can be ascertained with reasonable accuracy, but there are numerous demands on the company which are not reflected in the balance sheet, but must be arrived at through the application of a reasonable judgment. Among such items mention may be made of cash requirements to guard against contingencies; the allowance for temporary financing of plant extensions, the cost of gas which has been consumed by the customer since the last reading of his meter and also the cost of gas in the holders and distribution system. A review of all the balance sheet items and other factors materially affecting working capital must lead to the conclusions that an allowance for 1909 of \$3,200,000 is approximately correct. This amount is therefore used in the computation of the investment value upon which the stockholders are entitled to a reasonable return.

INTANGIBLE PROPERTY.

The analysis showing a valuation of \$49,023,947 as the cost of the property applies to the physical plant alone. This, however, does not necessarily represent the entire investment of the stockholder upon which he is entitled to a return. In addition to the physical value of the property allowance must be made for such items of intangible property as the company possesses. While courts have stated in a number of decisions the various elements of value, all of which must be taken into consideration in arriving at the final amount upon which the rate of return is to be computed, all agree that the value of the property for the purpose of rate-making is substantially the reproduction value, or the value of the property at the time of the investigation, thus giving credit for every increment in value and making allowance for the depreciation which has taken place. While the strictest adherence to the reproduction theory may work hardship to one party in a particular case, the rule can be applied with reason, and when so followed undoubtedly represents the established law. On this basis the company insists that the reproduction cost includes the value of the franchise and the going value of the corporation. No specific amount was suggested which appeared fair to the officers of the company, nor was any method submitted by which these values could be determined, but it was claimed that the valuation used in the adjustment of the rates must recognize an allowance for these intangible assets, both of which are indefinite and extremely difficult of determination.

The Peoples Gas Light & Coke Company is operating under a perpetual franchise of its own and has secured by purchase the franchises of a number of other gas companies which have been merged into the present corporation. These franchises, it is claimed, possess a large commercial value, and to exclude them from the investment would be

equivalent to taking private property for public purposes without due compensation. The term "franchise" is clearly understood and the question of its value from the standpoint of rate regulation has been the subject of court decisions, and while these are not as specific as might be desired, the reasoning of the court and the dicta of other cases suggests a disposition of the question here which it is believed will be just in view of the conditions under which the so-called franchise value has arisen. The term "going value" has never been defined by the courts or students of public-service problems in a manner to meet with general acceptance. Its existence, however, has been recognized by all the courts and public-service commissions and it must be allowed in computing the amount of the investment. Whether such value exists as an incident of the physical plant, whether it is entirely independent of the physical value and to be determined from other sources of information, as, for example, the number of customers or the gross earnings, or whether such value may deserve no consideration as an addition to the physical plant, depends largely upon the definition adopted.

A franchise authorizes the use of private property in a particular manner and generally conveys an exclusive right. In this particular instance the right issued from the people for the specific purpose of having the grantees of that right use it for the public good in the operation of a gas utility and with such profit to themselves as was represented by a reasonable return upon the capital actually invested. There is no proof that the company paid any value for this original right. It was a grant for which the people received nothing in return except the service to be furnished. The company made no franchise investment of its own at the time or thereafter. Its expenditures in constructing the gas plant and the development of the business represented investments in the business and not in the franchise. It is only by virtue of the franchise that the business itself could be developed. The mere granting of such a franchise or privilege conveys with it no right on the part of the grantees to a separate value in the franchise above the amount paid for it, distinct from its use in the business for which it was granted, which the parties may capitalize as against the public in rate adjustment proceedings.

To grant a value for the franchise as against the public, when no payment was made therefor to the public would be to increase the value of the investment of the company and hence increase the cost of gas. The question for the purpose of this valuation is two-fold: first, does the franchise possess value; and secondly, can it possess a value and the amount thereof be excluded in arriving at what constitutes a reasonable rate? Without going into any lengthy discussion of these two questions and their bearing on the rates in this investigation, the reason for taking the course which was pursued can easily be shown. That franchises

represent property is elementary. They are eagerly sought by capital for the privilege of serving the public and the promise of profit which such service holds forth. They pass from one interest to another for substantial consideration, in none of which the public ordinarily shares. These prices may be large because the profits under the existing rate schedule are liberal, but since such rates are subject to revision to a point where they cease to be unreasonable it is impossible to see how such valuation can long rest on this basis. Until the public sees fit to reduce the rates such profits are legal for the stockholders, but they do not constitute a basis for capitalization against the public.

If a franchise possesses any public value it must be such a value as will inure to the owners of the franchise because of the exercise of the privilege conveyed, subject to the legal and moral limitations surrounding it. Any value based on excessive rates is purely commercial and does not exist as against the public, since the franchise can not justly be exercised for that purpose. Since the utility is at all times authorized to charge rates which will yield reasonable returns, it may be assumed that any commercial value which attaches to the franchise is due to the general desire on the part of capital to seek an investment from which a reasonable return can always be obtained without serious risk to the invested principal. In the last analysis payments for franchises really indicate that certain investors are willing to pay a bonus for the right to engage in a particular utility service in the city in question, the amount paid representing the capitalization of the difference between the rate of return deemed reasonable for the utility purchased and the rate which the purchasers are willing to accept on their investment. Especially does this appear true when the losses in developing the business are considered as costs and permitted in the capital account. Under this theory the commercial value of a franchise represents the price which capital is willing to pay for a safe income. If rates are always retained at the point of reasonableness no great sum will ever be paid for the franchise and if payment is made it should be to the city, in which case the amount may justly be capitalized. If payments for franchises are very large with respect to the value of the physical property it would indicate that the schedule rates of the utility purchased are too high, or, what is equivalent thereto, that the rate of return deemed reasonable is higher than it should be in the judgment of capital seeking investment.

Further, the regulation of rates may be an exercise of the police power, but it is not equivalent to condemnation, even though the market value of the property may be affected at the time. If the rate reduction is based upon correct grounds it will be because the schedule has been unreasonably high, and since the franchise was granted to serve the public only at reasonable rates, the reduction of the value due to the

existence of excessive rates is but the removal of a value which existed subject only to the public will and sufferance. Rate reduction, therefore, when correctly made eliminates, as against the public, the value which existed only by public consent and not as a matter of right; condemnation is the actual taking of private property for a public purpose which in its private sphere was based upon the general principles of ownership of property. In the light of these general considerations no allowance is made in this investigation for franchise value. It is not intended to claim that such franchise has no value. On the contrary, it is believed that the perpetual right to manufacture, distribute and sell gas in the city of Chicago is very valuable from a commercial standpoint, but it is claimed that as such right was a grant from the people to the company without payment therefor, or any other restriction on the freedom of its most liberal exercise, the company has made no investment as against the public upon which the latter should be held to pay a return.

While the company can not be said to possess a property value as against the public in its authority to use its private property in a particular manner for the public good, it must be conceded that an allowance, intangible in its nature and large in the aggregate must be made, not as a franchise right but as a necessary cost of exercising that franchise. It is an elementary proposition, the correctness and justice of which must appeal to every mind, that the franchise to operate a public utility should be granted with the least possible restriction in order not to increase the capital investment, and that the company when once supplied with the franchise should be left to develop its business without hindrance and restraint in order that a low rate for service may ultimately be obtained. To charge a large sum for the franchise only adds to the interest burden to be carried by the public and likewise to heap one burden upon another in the exercise of that franchise by the company is adding costs to the business which must be met in one form or another. Fortunately for the public now, it did not exact any charge from the company in its grant of the original franchise, for which the public is free from burdensome obligations to-day, but in its attitude toward the gas industry in this city since the business was established, a most expensive policy has been pursued which has given rise to substantial investment rights.

The history of the gas business in Chicago extends over a period of more than sixty years. During this time there have been incorporated and authorized to operate in this city a large number of independent and competing gas plants. The details of the business development, the number of companies created, the bitter competition which ensued, the struggles of the different companies for existence, the combinations and mergers of interests and the legal warfare in state and federal courts is briefly outlined in the historical sketch embodied in this report. One

franchise after another was granted to supply the people with gas when the streets already contained mains of sufficient capacity to supply the demand, and plants constructed under then existing franchises possessed ample facilities and were provided with ample capacity to furnish all the gas required. These franchises entirely ignored the uncontrovertible fact that gas utilities are natural monopolies and that to authorize additional companies for the purpose of creating or continuing competition only creates economic waste. The most economical construction and operation, the most satisfactory service and consequently the lowest price for gas is possible only in the recognition of the economic law that utilities are natural monopolies and that their duties can best be discharged when the franchise is held by a single company and that company regulated by proper administrative agents of the public. The best economic thought, substantiated by history in nearly every large American city, is that all efforts to compel competition in public service must terminate in open or secret combination. To authorize several gas utilities to operate in the same city means ultimate duplication of plants and the wasting of capital.

It is impossible to trace the history of the gas business in Chicago without realizing that the policy pursued has created tremendous losses. Plants have been built, streets torn up and the development of the business of established companies greatly hampered, if not partly destroyed, for all of which there was no real occasion. To protect itself in such a situation there was little which an established utility could do except to purchase its rival outright or to enter into an agreement at the earliest possible date before extensive investments were made. This situation in a sense created prior to 1897 a ready market for franchises and the prices varied with the possibilities of the newer companies and probably also with the influence of grantees. That this situation with its opportunity for private profit in addition to the desired competition was clearly realized may be assumed from the number of franchises granted and the prices paid therefor. Unfortunately the records of these many transactions are not as complete as they should be in order to make possible the most satisfactory analysis of the intangible values due to the forced investment, but there appears to be sufficient data to warrant a belief that some of those who were entrusted with the protection of the public rights and also certain officers of the purchasing companies found in the combinations means for mutual profit. When the public, even with the best intention, has thrown obstacles in the way of development of its utilities, leaving them no option except to remove those obstacles at a heavy cost or to engage in a struggle in which the company must inevitably suffer, such burden in law and in common fairness must be regarded as an investment expenditure. Where such expenditure is increased because of private gain this amount should not be considered

as an addition to the investment. The problem in each case is to determine the legitimate expenditure which the existing company could not avoid because of the city's erroneous policy.

That such repeated efforts to enforce competition create investment values of an intangible nature as against the city was held in the case of *Wilcox v. Consolidated Gas Company* (212 U. S., 19). Prior to 1884 there were seven gas light companies in New York City, each operated under separate rate charters granted at different times between 1823 and 1865 or 1871. They each had the right to use the streets of certain portions of the city for the purpose of laying mains and service pipes in order to furnish gas. Not one of the companies had ever been called upon to pay for such privilege. In 1884 authority was given by law to consolidate these corporations upon conditions named in the act, which specified, among other things, that the amount of capital issued should not be in amount more "than the fair aggregate value of the property, franchises and rights of the several companies to be consolidated." A legislative committee of investigation found that the franchises of the merged companies were reasonably worth \$7,781,000 and stock to this amount was included in the total issue. The court held that the public having approved the consolidation and the amount of securities issued on this basis, should not be permitted to question the valuation at this time and therefore accepted the valuation fixed under the act of 1884 as conclusive, but did not permit an increase in franchise value since the consolidation.

The consolidation of the several gas companies into The Peoples Gas Light & Coke Company was made in 1897 under state authority expressed in the Gas Consolidation Act. As explained in another part of this report, this company assumed the bonds of the merged companies and issued stock to the amount of \$25,000,000 which was subsequently placed with investors. In the merging of these companies making up the present consolidation, some of which themselves represented a combination of gas companies, there were included those expenditures which had been incurred in purchasing the competing plants, the cost of which had been charged to the construction or plant account of the purchasing company. This account contained, through these acts, heavy charges for duplicate property and expenditures for franchises. From all the data which can be obtained concerning plant values and yearly construction, it is doubtful if an appraisal of the property embraced in the merger of 1897, including overhead charges and a reasonable discount on securities, would have shown physical value in excess of \$27,000,000. It is clear that the property value was not equal to the bonded debt assumed, leaving the total capital stock without any foundation in tangible property. The construction account on December 31, 1897, five months after the merger, showed an investment of \$60,181,559, against

which there were outstanding stocks and bonds to the amount of \$59,246,000.

It will be observed that the facts in this case are somewhat similar to those in the New York case above referred to, in which it was held that a reasonable investment value in the franchises was created, the extent of which the public was estopped to deny. It also found in the same act of estoppel a measure of value for the property in excess of the physical value. In this valuation, however, neither the city of Chicago nor the State of Illinois has ever by agreement, sanction or acquiescence, committed any act which would estop it from denying the existence of franchise value. If any value exists in this case over and above the physical value it must be founded on some ground other than that of estoppel to deny franchise rights, and it is believed that such a ground exists. The value in this case is founded on the basis of cost. Since for all practical purposes the policy of the city compelled the older company to purchase the newly organized companies, the amount which it was honestly compelled to pay represents an expenditure which can be regarded either as a cost of extending and strengthening the business or as a necessary loss in maintaining the business. In either event the expenditure must be met by the investors in the gas business, and since the public compelled this act which increased the cost of the plant it should in all fairness be estopped from denying the reasonable consequences of its acts. Where an expenditure is made necessary by an act of the public which increases the cost of the plant, or adds to the operating expenses of the utility, it is but fair that the city, as between the investor and the public, should bear the burden of such costs. The question here is not one of franchise values but of costs of business. This expenditure is not intangible property in the sense that it creates a right to perform a specific act, although it is intangible to-day in that there is no physical property in existence for the payment.

That such present value is difficult to determine is no proof of its nonexistence. While it can not be computed with accuracy it can be approximated. It may safely be assumed that the actual plant value in 1897, when the present company came into existence, was not in excess of the amount of securities issued. In fact, it is known that the physical plant value was less than the amount of the bonds assumed. If the value of the stocks and bonds at the date of consolidation be taken as the investment value of the property an injustice would be done to the public, since the balance sheet shows the par value of the securities which it is known exceeded the market value at the time of the consolidation, and also because a reduction should be made from the total for what appears to be unreasonable personal profits and excessive prices paid in the transactions. The subject of valuation, with respect to this question, has been carefully analyzed from all the records which

could be obtained, and it is believed that if the physical value of substantially \$27,000,000 is increased by an amount of approximately \$10,000,000 to represent the intangible value due to the necessary investment costs and an allowance be made for working capital, the fair value as of 1897, in round numbers, should be \$39,000,000, instead of the amount of securities shown at that date. With this amount as a value in 1897 it is possible to compute the fair tangible and intangible value as of 1909, the records since the above date being complete.

The court, in the Consolidated Gas case above referred to, held that the intangible value there allowed and which the city was estopped to deny, did not increase with the growth of the business. Neither is there any ground for believing, under the reasoning in that case, that the intangible value of the Peoples Gas Light & Coke Company has increased because of the great increase in physical value since 1897. The question naturally arises, if the city by its early action compelled the company to increase its cost of plant, which must be allowed as part of the investment, is it possible by any subsequent act of the city to reduce that value? If adverse acts of the city result in investment increases, does it not logically follow that any acts of the city which permit a return over and above that which is deemed reasonable on a fair valuation should, by the amount of such excess, be applied as a credit to the investment and thus reduce the valuation so created against the public? Whether there has been an increase or reduction of the going value under this theory must be determined from an analysis of the company's records since 1897.

The disposition of the franchise value may be summarized by the statement that franchises are property, but that no value should be allowed as against the public in rate adjustments except to the extent of the price paid for them to the community. Even though no amount be allowed for franchises in the valuation an addition must be made to the physical value to the amount of reasonable costs which were incurred due to the municipal policy of forced competition and that such losses constitute construction charges which the city in justice is estopped to deny. Since the public is to be charged with the costs incurred through its erroneous policy in the form of an increased investment, the same logic requires that the public receive the benefit through a credit to such intangible investment by any amount which the company may have been permitted to earn since 1897 over and above a reasonable rate of return on the investment actually made. The discussion of the subject of the intangible value of the company's property as affected during the last thirteen years is so involved with the subject of going value that digression is here made to the latter subject.

While no definition of the term is entirely satisfactory, it is admitted by authorities that the "going value" represents an element of value due

to the company in question being a live, active, operating plant instead of a bare physical mass of material. Going value must not be confused with "good-will" which implies the exercise of choice on the part of the customer as to which of several establishments offer the best inducements for his patronage. Since a gas utility is a natural monopoly there can be no room for selection by the customer. If there is only one establishment which can supply the people, there is no "good-will" value due to their choice to take its product or subscribe to its service. Every one will agree, however, that a given plant having a valuation of \$50,000,000, with an established business supplying 500,000 customers with its product, is worth more to the present investor and to the prospective purchaser than is the same plant ready to serve the community, but with no customers attached for service and its business undeveloped. Experience shows that it costs a great deal to develop any business. The early years of nearly every business are beset with many serious difficulties which not infrequently terminate in bankruptcy. The problem is how to measure the value of such an established business for the purpose of rate adjustment.

It has been claimed by some, and also advanced in this valuation, that if the going value of a company represents the cost of developing its business, it means the value of the present patronage of the company. From an analysis of the records it is possible to obtain an accurate statement of the cost of securing a customer. If the company in question has 522,000 customers, as is true in this case, the going value, with the assumed cost of development of \$30.00 per customer, would mean a value of \$15,660,000. Regardless of the justice or injustice of this amount it will readily be seen that this is not the proper measure of going value. The average rate per customer which the records show will be an average over recent years and will not cover the entire history of the company. This method fails to give information as to the cost of development at the time when development is a real problem to the company. In order to be accurate it should consider the cost of securing business during the entire history of the company, so that the development expenses as determined would be the development cost of this particular plant under the difficulties which confronted it at different times. It is generally known that fifteen or twenty years ago the use of gas had not reached the stage of necessity which it holds to-day, and that it required more argument, solicitation and many inducements to secure the development of the business. This method of arriving at going value does not, therefore, recognize the investment which the company has made for the development of the business.

The theory in this case, however, that of reproduction as of the time of the investment, must recognize that gas is to-day not an unknown quantity. It is a service of general use. It does not require

so large an expenditure to develop the gas business to-day in a large city as was needed a generation ago. Everybody knows the value of gas for heating and for illumination. There is always a certain inertia to be overcome, but this calls for less expense to-day than was necessary years ago. Development expenditures must be incurred even to-day, for every utility must be continuously engaged in campaigns of education to secure the widest and at the same time most economical use of gas. These expenses are proper operating expenses and as such should be included in the expense accounts. To also capitalize them would mean the duplication of expenses.

If the reproduction rule means the cost of development of an equal business as that which exists to-day, as if, to be more clear, the present plant passed out of existence and its customers would have to be solicited to use gas of the new company to take its place, it must be remembered that no such expense for development would be required as was generally necessary years ago, or as was actually incurred by the company. Reproduction means reproduction now, at the time of this investigation, and this is the time when thousands of gas users are thoroughly alive to the advantages of gas and demand its widest possible use. These customers, as a rule, are not seeking education to-day on the uses of gas. The general demand in 1910 and 1911 is the demand for adequate service and reasonable rates. Given these conditions under the reproduction theory, it is safe to assume that a very large proportion of the present customers would take gas from the company without solicitation or any demonstrations. Some would require visits by solicitors to induce them to take gas from the new proprietors and a number probably would be lost entirely, but it is obvious that when the public has become accustomed to the use of gas as under present conditions, the cost of reproduction would apply only to a portion of the present customers. To attempt to measure going value by applying a development cost per customer to the entire number of customers is therefore unjust, not only because it does not recognize the losses and surplus profits during the operation of the business, but for the reason that a very much lower rate per customer should be used than the average cost of development shown by the books.

Another basis suggested for the measuring of going value was to allow an amount equivalent to one year's gross income. This suggestion has the merit of simplicity, but is unsound because the going value of the company as of to-day has no definite relation to the gross earnings. Going value has no reference to the capitalization of the plant on the basis of its earning capacity, for that would be governed largely by the present rate schedule, which may be too high. The real basis of the suggestion is that in a number of plants the cost of developing the business has been found upon investigation to be substantially equal to

the gross earnings for one year. In this instance the going value, following this method, would be approximately \$15,500,000. It will be seen that in this case this value is almost the same as what would be the going value if computed on a cost per customer basis. It would appear that the similarity of the two figures is a matter of accident rather than that it represents substantially the measure of the going value. The gross earnings of to-day give no information as to the cost of developing the business. In one city the public may have been ready for the gas utility and customers were easily secured. In another city the service may have been in advance of its necessity and owing to the cheapness of other fuel and illuminants development was slow and expensive. The gross earnings may be an element to be considered in arriving at the going value of a corporation, but can hardly be accepted as a true measure of it.

Another measure for determining going value, one which has served several times in computing the intangible worth of water-works plants and the adoption of which was strongly urged by the engineers of the company in this valuation, is based upon the cost of reproducing the business of the corporation under conditions of to-day. This method assumes that an investor is desirous of engaging in the gas business in Chicago and has in his possession sufficient capital to purchase the present plant. Leaving aside for the sake of argument the question of franchise rights, the investor must decide whether to purchase the existing plant with its established business, or to construct a plant of sufficient capacity and develop the business so that at the end of the necessary construction and development period the new plant will have overtaken the present plant and will have a business of substantially the same proportions as that of the present going concern. This method aims to place a value upon an established income and to determine whether it is more economical to purchase the going concern with its established business or to develop the business.

This method is of course purely theoretical, but it is based upon assumptions founded in actual practice and although not conclusive it deserves consideration. The length of time required to build a plant as large as that needed to serve Chicago, the actual construction and overhead charges, the interest rates to be paid during construction, the probable date when gas could first be sold and the increasing output each year with the extension of the plant and the development of the business are matters which the company's engineers believed could be estimated with a considerable degree of accuracy. To show the application of this reasoning as indicating the amount of going value several tables were submitted showing the growth of the existing or going concern and the development of the hypothetical plant. These tables are herewith presented. It was necessary for the purpose of this computation to

assume a plant value, a working capital and a going value for the plant now in operation. The operating expenses, taxes and depreciation requirements were taken from the present company's accounts. It was further necessary to assume a rate of increase in business from the beginning of the period covered in the table for both the present plant and the hypothetical plant. It is considered that the hypothetical plant will be built as rapidly as is consistent with good engineering practice, and the financing of the enterprise will be on the most favorable basis under present conditions. Construction, it is assumed, will be started on January 1, 1911.

In the tables the sum of \$42,000,000, exclusive of the office-building investment, was taken as the physical value of the plant necessary for the manufacture, distribution and sale of gas, which amount was apportioned over the principal classes of divisions of property. The allowance for working capital was placed at \$4,000,000 and the estimated going value of the present plant was placed at \$12,800,000, showing a total investment value of \$58,800,000. It is assumed that a period of ten years would be required to complete the plant with all of its present facilities, although gas would be supplied to some customers before the end of the second year and each year to an increasing number as the plant was extended into new territory. The extensions of the plant would be made as rapidly as possible and the time assumed in this instance is based upon the best available records of continuous construction in large undertakings which the company possessed. The plant would naturally be built so as to supply some customers at the earliest possible date and efforts would be centralized to complete the plant first in the most profitable business section. Neighborhoods would be canvassed in advance of actual construction, so that the plant would be self-sustaining as soon as possible, or at least earn part of its operating expenses.

The first year, it is assumed, in all probability would be given over to securing franchises, taking out incorporation papers, perfecting the organization of the corporation, selecting office locations, closing contracts and making surveys. Real estate would be acquired early, as shown to be needed by the surveys, for the location of manufacturing stations, holders and pumping stations. The amount allowed for real-estate purchases in this instance has been based upon the idea that plants would be constructed simultaneously in the different divisions of the city. Additional land would be purchased the second year and the immediate requirements probably completed by the end of the third year, although the construction of mains, services and meters would continue rapidly throughout the entire ten-year period, thus extending the service into new territory to additional customers and greatly increasing the output to near capacity. The following tables show the computations under this method of measuring going value.

ESTIMATE OF EXPENDITURE FOR CONSTRUCTION BY YEARS.

10-YEAR PERIOD.

YEAR.	Real Estate.	Stations.	Mains.	Services	Meters.	Overhead Expense.	Working Capital.	Estimated Going Value.	Total.
1911.....	\$1,500,000	\$ 500,000	\$ 300,000	\$100,000	.....	\$ 615,000	.....	.....	\$ 3,015,000
1912.....	500,000	1,000,000	2,000,000	700,000	\$ 700,000	1,500,000	\$ 700,000	\$ 2,000,000	9,100,000
1913.....	585,000	1,500,000	2,200,000	750,000	800,000	1,500,000	800,000	2,700,000	10,835,000
1914.....	.....	1,500,000	2,200,000	750,000	700,000	1,000,000	700,000	3,600,000	10,450,000
1915.....	.....	1,000,000	2,200,000	750,000	700,000	500,000	700,000	1,900,000	7,750,000
1916.....	.....	1,000,000	1,500,000	400,000	400,000	500,000	400,000	1,300,000	5,500,000
1917.....	.....	1,000,000	1,500,000	400,000	300,000	500,000	300,000	650,000	4,650,000
1918.....	1,000,000	300,000	700,000	250,000	200,000	500,000	200,000	350,000	3,500,000
1919.....	.....	1,000,000	300,000	100,000	100,000	300,000	100,000	200,000	2,100,000
1920.....	.....	1,000,000	300,000	100,000	100,000	200,000	100,000	100,000	1,900,000
	\$3,585,000	\$9,800,000	\$13,200,000	\$4,300,000	\$4,000,000	\$7,115,000	\$4,000,000	\$12,800,000	\$58,800,000

INTEREST CALCULATION.

	Total Investment in Plant to Date.	Amount of Capital not used in Construction Invested at 4%.	Interest at 4%	Amount Withdrawn for Construction During Year Invested at 2%.	Interest at 2% Six Months.	Total Interest on Unemployed Capital.
1911.....	\$ 3,015,000	\$55,785,000	\$2,231,400	\$ 3,015,000	\$ 30,150	\$2,261,550
1912.....	12,115,000	46,685,000	1,867,400	9,100,000	91,000	1,958,400
1913.....	22,950,000	35,850,000	1,434,000	10,835,000	108,350	1,542,350
1914.....	33,400,000	25,400,000	1,016,000	10,450,000	104,500	1,120,500
1915.....	41,150,000	17,650,000	706,000	7,750,000	77,500	783,500
1916.....	46,650,000	12,150,000	486,000	5,500,000	55,000	541,000
1917.....	51,300,000	7,500,000	300,000	4,650,000	46,500	346,500
1918.....	54,800,000	4,000,000	160,000	3,500,000	35,000	195,000
1919.....	56,900,000	1,900,000	76,000	2,100,000	21,000	97,000
1920.....	58,800,000	.....	.....	1,900,000	19,000	19,000

THE GOING PLANT—10-YEAR PERIOD.

Sales, Cu. Ft.	Year.	Revenue from Sale of Gas at 85c.	Int. on Unemployed Capital.	Gross Revenue.	Operating Expenses, Inc. Taxes.	Depreciation.	Total Operating Expenses.	Net Income.	Factor for Present Worth 5%.	Present Worth of Net Future Return.	Going Value Difference.
18,000,000,000	1911	\$15,300,000			\$ 9,630,000	\$ 800,000	\$10,430,000	\$4,870,000	.9524	\$4,638,000	
19,000,000,000	1912	16,150,000			10,165,000	850,000	11,015,000	5,135,000	.9070	4,657,000	
20,000,000,000	1913	17,000,000			10,700,000	900,000	11,600,000	5,400,000	.8638	4,665,000	
21,000,000,000	1914	17,850,000			11,235,000	950,000	12,185,000	5,665,000	.8227	4,661,000	
22,000,000,000	1915	18,700,000			11,770,000	1,000,000	12,770,000	5,930,000	.7835	4,646,000	
23,000,000,000	1916	19,550,000			12,305,000	1,050,000	13,355,000	6,195,000	.7462	4,623,000	
24,000,000,000	1917	20,400,000			12,840,000	1,100,000	13,940,000	6,460,000	.7107	4,591,000	
25,000,000,000	1918	21,250,000			13,375,000	1,150,000	14,525,000	6,725,000	.6768	4,551,000	
26,000,000,000	1919	22,100,000			13,910,000	1,200,000	15,110,000	6,990,000	.6446	4,506,000	
27,000,000,000	1920	22,950,000			14,445,000	1,250,000	15,695,000	7,255,000	.6139	4,454,000	
28,000,000,000	1921										
Total										\$45,992,000	

THE HYPOTHETICAL PLANT WHICH OVERTAKES THE GOING PLANT ON JANUARY 1, 1921.

	1911		\$2,261,550	\$2,261,550	\$ 425,000	\$ 100,000	\$ 525,000	\$2,261,550	.9524	\$2,154,000	\$2,484,000
500,000,000	1912	425,000	1,958,400	2,383,400	1,850,000	200,000	2,050,000	1,858,400	.9070	1,686,000	2,971,000
3,000,000,000	1913	2,550,000	1,542,350	4,092,350	3,800,000	300,000	4,100,000	2,042,350	.8638	1,764,000	2,901,000
7,000,000,000	1914	5,950,000	1,120,500	7,070,500	5,735,000	400,000	6,135,000	2,970,500	.8227	2,444,000	2,217,000
11,000,000,000	1915	9,350,000	783,500	10,133,500	8,310,000	550,000	8,860,000	3,998,500	.7835	3,133,000	1,513,000
16,000,000,000	1916	13,600,000	541,000	14,141,000	10,400,000	700,000	11,100,000	5,281,000	.7462	3,941,000	682,000
20,000,000,000	1917	17,000,000	346,500	17,346,500	12,105,000	925,000	13,030,000	6,246,500	.7107	4,439,000	152,000
23,000,000,000	1918	19,550,000	195,000	19,745,000	13,642,500	1,150,000	14,792,500	6,715,000	.6768	4,545,000	6,000
25,500,000,000	1919	21,675,000	97,000	21,772,000	14,177,500	1,225,000	15,402,500	6,979,500	.6446	4,499,000	7,000
26,630,000,000	1920	22,635,500	19,000	22,654,500				7,252,000	.6139	4,452,000	2,000
28,000,000,000	1921										
Total										\$33,057,000	\$12,935,000

The figures contained in these tables were taken largely from the company's own records, although certain changes were made after conference with its engineers and additional data supplied by estimate. It will be noted that the value of the physical property in the hypothetical plant is not the actual physical property which would be required for the assumed output at the end of the period of development, but instead is more nearly equal to the value of the property of the present plant at the beginning of the period. Since whatever construction would be necessary during the development period must be added to both the present plant and the hypothetical plant and therefore would not affect the result, the amount has been omitted from the calculation.

Beginning with a total investment value of \$58,800,000, the tables show the investment to-day, the amount of the total available capital not used in the enterprise on which a return of 4 per cent is assumed, and that amount which is withdrawn for construction during the year on which 2 per cent is allowed for one-half the period, or its equivalent of 1 per cent on the amount withdrawn for the entire period. The income from sales of gas is placed at 85 cents per thousand, which is the present rate. The operating expenses during the first three years would naturally be somewhat higher per thousand cubic feet than for the same years in the present plant. Particularly during the first years it is unlikely that the plant would be operated at capacity. The machinery would be new and require frequent adjustment and operators would have to be trained in their duties. It is assumed in the tables that the hypothetical plant would be placed in operation September 1, 1912, and that for the four months of that year the operating expenses would be 65 cents per thousand. During the second year a cost of 55 cents is assumed, 50 cents for the third year and 48½ cents per thousand for the remaining years, which last rate is that shown by the company's books at present. Depreciation and tax estimates are based on the property in use for the given year and reach at the end of the period substantially the same figures as those in the going plant. By adding the interest from the unemployed capital to the net income from operation for the year the table shows the total income for the period, the present worth of which is determined on a 5 per cent basis. The difference between the income of the going concern and the income of the hypothetical plant for the same year shows what going value has accumulated. The sum of these yearly accumulations amounts to \$12,935,000, as against the assumed going value of the present plant of \$12,800,000. It would appear therefore from the tables that the correct value was somewhere between these two amounts.

This method, while it arrives at a going value which does not appear to be very unreasonable, is open to criticism and apparently the greatest reliance can not be placed upon the result in this case. While no single

formula can be followed to show exactly what constitutes the proper allowance for this purpose, it is believed that on broad principles of justice a consideration of both profits and losses should be recognized. There is no such recognition in this method. Neither does this method recognize the rapidity with which the business of the company was actually developed, nor any extraordinary expenditures or changed conditions, such as those due to competition or unfavorable legislation, either municipal or state. The conclusion is arrived at almost entirely on a basis of assumptions which are largely independent of local conditions confronting the property at present, or under which it was developed in the past. The calculations begin by assuming that which it is sought to prove, and the correctness of the computations lies in arriving at a final value which justifies the original estimate. The result is also affected by the amount assumed to represent the present physical value. If such value is high the going value arrived at will be reduced. In justice to this method it should be said that an extensive investigation of the company's records would show information and units more nearly correct than the assumptions which were used. It should also be stated that somewhat different figures instead of those assumed would not greatly affect the result, since they would apply equally to both properties. The real purpose of this table is to show the cost of developing the business, a calculation which, if used as the basis of valuation, should take into consideration other factors than those embraced here. While its application under certain conditions may lead to correct values, at which times it may be the best of the several methods available, it is no more likely to give correct results under specific local conditions than is the application of average cost units to result in a correct physical value in a particular appraisal. This method of arriving at going value possesses some merit and like those previously discussed was considered in arriving at the final amount, but it is not sufficiently proof against criticism to warrant the adoption of its results without additional data.

Whatever single method should be followed for determining going value, if there is such a correct method, it is believed that the final calculation should be tempered with a consideration of fairness to all interests. The amount involved representing many millions of dollars and the effect on the final rate schedule both as regards the investor and the public requires that consideration be given to equity as well as to mathematics. A high going value means a large investment upon which returns must be allowed and this requires a high gas rate; a low going value, or no allowance for going value at all, means a smaller interest requirement and consequently permits a low rate for gas. It is therefore possible to secure a very low gas rate if the value of the plant is placed sufficiently low, but court decisions are firm in defining particular elements of value. Capital does not obey the mandate of public or private opinion unless

such opinion is founded in justice and sound economics. To be correct in the final analysis the valuation arrived at must recognize the clear rights of capital invested in public enterprises, but it must not lose sight of the rights of the public. There is no question but what corporations engaged in public service are by virtue of their character invested with valuable rights and privileges and in return charged with well-defined duties. The public, by virtue of whose grant these corporations exist, is entitled to the proper discharge of their duties and likewise owes certain obligations. In most instances these duties and obligations are clearly defined by the courts. In some instances where the decisions are indefinite, or the subject has not been adjudicated, political economy supplies what the law omits. Where the courts have defined the basis of valuation with respect to the different classes of property the allowances in this report have followed such cases. Where the law is not definitely settled mooted questions of valuation have been decided upon a basis which appeared reasonable and just in the premises. With these principles in mind it is believed that the going value of the Peoples Gas Light & Coke Company can best be determined from its own records and history.

A public service corporation is entitled both by common law and by statute to a reasonable return upon its investment. If a given rate schedule yields more than a reasonable return to the investor it is an injustice to the public and the rates should be lowered. If the rates fail to produce sufficient revenue the investor is not receiving that return to which he is entitled by law. If he has received a reasonable return each year on his investment from the beginning of the enterprise justice would seem to be satisfied, at least as against the public, without allowing any increase in the value of the property which produced that income to represent going value. If the investor has failed to receive each year that amount which constitutes a reasonable return he should be permitted to charge rates sufficiently high to reimburse him for early losses, or such losses should be considered as costs of developing the business and their addition to the value of the physical property permitted. Such additions, from an equitable standpoint at least, may be said to constitute the correct going value of a public service corporation. The application of this doctrine to the facts in this city and the logic upon which it is founded is shown in the following discussion.

New plants seldom yield a return on the investment during the first year of operation. In fact, it is more likely to require a number of years of continuous effort to establish a business on a firm basis, while the history of the gas industry clearly shows that many of such plants have not reached a position of profit to the investor until many years after their construction. During the earlier years a large amount of money is required for development purposes. Where a corporation is in posses-

sion of adequate capital, expenditures of this character can be made without serious loss to the stockholders, but where, as is almost universally the case, the business is developed out of the earnings at the expense of interest and dividend payments, a deficit will result. When a corporation is earning less than its operating expenses, interest and depreciation, it is absolutely necessary that the stockholders make further payments for development purposes. Where a small surplus is earned, such amount may be used for development purposes, but it is at the expense of the stockholders' rights unless such development requirements are recognized in the capital. If the development cost is not met out of the earnings it must be met directly by the sale of securities, which becomes a liability against the plant.

The amount by which the earnings fail to meet the operating expenses and the return on the investment creates deficits which constitute the cost of building up the business. Just as supervision, interest and insurance during construction are expenditures to be added to the construction cost of the plant, so the deficits representing the amounts by which the stockholders have failed to receive their reasonable return are costs to be added to the value of the physical plant in order to show the complete investment which has been made in the industry as a live, going concern.

The cost of developing a gas industry consists of expenditures for advertising, soliciting, demonstrating, the sale of appliances at less than cost, free house piping, and, in some instances, free gas for a limited period. Concessions in rates below actual cost are also given to stimulate a large and general use of gas. Development expenditures may further be increased through the failure of the plant to earn even its current operating charges for a number of years, when the stockholders must supply additional capital to keep the plant in operation. Such expenditures are additional investments upon which the stockholder is entitled to a return as well as upon expenditures for physical plant. The investor has a right to expect reimbursement for such losses. They are legitimate costs of business. The public has a right to exclude from the valuation of utility properties upon which it is compelled to pay reasonable returns all amounts representing unnecessary expenditures, excessive discounts on securities, promotion fees, expenditures due to poor management and extravagance and errors of judgment which the exercise of reasonable care and foresight might have avoided. It, however, can not avoid payments on a valuation consisting of necessary expenditures honestly made, and the cost of operating the plant until it reaches the point where it returns the reasonable interest to which the investor is entitled by law. The cost of securing a paying business can best be computed from a cost analysis of the annual surplus and deficit shown by the records.

Capital is not unmindful of the uncertainties of business development.

Money seeks the avenue of greatest returns consistent with security and stability. A return of 5 or 6 per cent in a safe investment will attract capital, while a 10 per cent return which is accompanied with a considerable element of risk will find little encouragement. If, however, the return which is considered reasonable in any instance in view of the risks inherent in the venture, can not be secured until several or many years from the date of the original investment, and additional capital must be provided in the meantime upon which no return will be allowed, utility development will be retarded and, in some instances, it will be indefinitely postponed. To prevent the progressive development of business results in hardships to the customers and to the public generally and would tend to keep operating unit costs at a higher level. It would be unjust to the stockholder to deny him a return upon his money actually and honestly invested. A utility has no legal right to charge more than a reasonable rate, and if this is not to be computed on the development of the business and unavoidable losses, as well as on the investment in physical property, the reasonable rate allowed in after years when the industry has reached a stable basis will not be a reasonable rate on the amount actually invested. Losses need not be considered in the valuation, provided a rate of return is permitted which includes an allowance over and above the rate deemed reasonable, which will serve to reimburse the stockholder for his early losses. It necessarily follows that where the rate for service must be reasonable, and as such is subject to regulation by law, the early losses must be regarded as a part of the investment until restored to the stockholder by means of a higher rate of return on his investment. Equity admits of no other disposition.

As an offset in favor of the public, equity requires that if the deficits incurred in building up the business are to be regarded as a part of the investment, any surplus earnings, over and above a reasonable return on the legitimate investment, should also be taken into consideration. If the utility has earned in its later years a large profit because of favorable rate schedules, this excess above a reasonable return should be considered as a reimbursement for some of the early losses. The rule of justice should work in both directions.

This manner of arriving at the fair present investment value to be used as the basis of rate adjustment was suggested by the court in the case of *Mo., Kan. & Tex. Ry. Co. v. Love* (177 Fed. 493, 496) as follows:

An established railroad system may be worth more than its original cost and more than the mere cost of its physical reproduction. It has passed the initial period of little or no return to its owners which, of greater or less duration, almost always follows construction, and is not infrequently marked by default and bankruptcy. The inevitable errors in its building which finite minds and hands can not avoid have been measurably corrected, time and effort have produced a commercial

adjustment between it and the country it was intended to serve, relations have been established with patrons, and sources of traffic have been opened up and made tributary. In other words, the railroad, unlike one newly constructed, is fully equipped and is doing business as a going concern. It has attained a position after many experiences common to railroad enterprises which entail loss and cost not paid from current earnings, and which correspondingly make for value.

This method was perfected and extensively applied by the Railroad Commission of Wisconsin in the leading utility rate cases which have come before that body. The rule was stated in *Hill, et al, v. Antigo Water Company* (3 W. R. R. C., 623), as follows:

In other words, the plant was losing money while it developed its business. These losses or deficits had to be met by the owners and may be said to constitute the additional investment necessary to build up the business. These deficits therefore represent the cost of the business in very much the same way as that in which the cost of construction represents the cost of the physical plant. In fact, the one appears to be as legitimate and necessary a part of the cost of the enterprise as a whole as the other, or of that cost upon which a reasonable amount for interest and profits should be earned. This appears to hold good at least until the deficits or the investments occasioned by them have been made good and restored to the investors, either through surplus profits or in some other form. Such treatment of the cost of building up the business is equitable as between the investors and the consumers in this case. In the long run such treatment or its equivalent to the investor is also necessary in undertakings of this character in order to obtain the capital that is required.

The same principle was adhered to in *re Investigation of Menomonie and Marinette Light and Traction Company* (3 W. R. R. C., 778), and in the case of *State Journal Printing Company vs Madison Gas & Electric Company* (4 W. R. R. C., 501).

The logic of this reasoning has recently been approved by the Supreme Court of the State of Oklahoma in the case of the *Pioneer Telephone and Telegraph Company v. Westenhaver*, in the following language:

Few industries, if any, . . . can be made self-sustaining from the first day of their operation. The uncontradicted evidence in this case discloses that appellant's plant for the years preceding the first hearing, failed to produce revenue sufficient for operating expenses, current repair and lay aside an amount for depreciation. During the time of development there is a loss of money actually expended and of dividends upon the property invested. How shall this be taken care of? Must it be borne by the owners of the plant? Or by the initial customer? Or shall it be treated as a part of the investment or value of the plant constituting the basis upon which charges

shall be made to all customers who receive the benefits from the increased service rendering power of the plant by reason of these expenditures? It seems that the last solution is the logical, just and correct one. If rates were to be charged from the beginning so as to cover these expenditures and earn a dividend from the time the plant is first operated, the rate to the first customers would be in many instances, if not in all, so exorbitant as to be prohibitive and would be so at the time when the plant could be of least service to them. On the other hand, the public can not expect as a business proposition or demand as a legal right that this loss shall be borne by him who furnishes the service; for, investors in public-service property make such investments for the return they will yield; and, if the law required that a portion of the investment shall never yield any return, but shall be a total loss to the investor, capital would unwillingly be placed into such class of investments; but the law, in our opinion, does not so require. Private property can no more be taken in this method for public use without compensation, than by any other method. When the use of the property and the expenditures made during the nonexpense paying and nondividend paying period of the plant are treated as an element of the value of the property upon which fair returns shall be allowed, then the burden is distributed among those who receive the benefits of the expenditures and the use of the property in its enhanced value.

The above method of computing the going value and the derivation of the final investment value has been described at length because of the reliance placed upon the conclusions which it shows. It is believed to be the most equitable solution of the problem of going value, since by this means the investor is protected in the development of the business, and the public is insured against the dangers of excessive valuations. This method of computation is not advanced as being infallible. On the contrary, there are many cases where this reasoning could not properly apply, either because of specific conditions or the absence of financial data covering many years of operation. If every valuation could be solved by the application of a single rule, rate adjustments would be simple indeed. At no time can the exercise of judgment be entirely eliminated. Each case must be analyzed on its own peculiar facts. In this particular case this method of reasoning is believed to be proper.

Reverting to the discussion of franchise values and the cost incurred by the company in developing its business and the expense due to the purchasing of competing plants, it was found that the fair value of the plant in 1897, including physical valuation, working capital and the going value, was approximately \$39,000,000. By applying the above reasoning to this valuation and by an analysis of the company's profits and losses since 1897, it is possible to determine the fair investment value of the plant at the end of any subsequent year. This computation is shown

by a progressive statistical analysis based on the company's records and embraced in the accompanying table.

The table begins with the valuation of \$39,000,000, this value including, as above stated, the physical value, the working capital and the allowance for going value. Seven per cent is deemed to be a reasonable rate of return at the present time, but in the historical treatment of this subject, an income rate must be used which is reasonable, not so much under present conditions but reasonable for the year when it is used. If seven per cent is reasonable to-day, it is believed that eight per cent was reasonable some years ago. The table is, therefore, based upon a rate of return of eight per cent for the years from 1898 to 1906, inclusive, and a rate of seven per cent since that date. The yearly requirements under these rates are shown in the second column. Column three shows the additions to the physical property and to the working capital, and in the following column is shown the annual requirements for earnings on these additions. Since the additions are extended over a period of twelve months, the interest rate is applied only for six months, or one-half of the time, since very little construction was completed during the first month and practically all of the investment of this character was completed in the twelfth month. The next column shows the necessary operating expenses, including depreciation. The next column shows the total of the foregoing columns, which is the total amount which the stockholders put into the business during the year, or which they would have put into it if the earnings would permit, and if the earnings were insufficient indicates the amount of losses which accrued. Against this total there is shown in the next column the gross earnings, or the amount which the stockholders took out of the business. The deduction of those earnings from the total cost contained in the preceding column shows in the last column the cost of the plant, or its investment value at the close of the year. According to this table, the investment on which the stockholder is entitled to a reasonable return is equal to \$60,933,630. There should be added to this total the amount of \$916,249, representing construction work practically completed and partly in service but technically not yet turned over to the company, and for which payment will not be made until final certification from architects as to the compliance with all specifications. With these adjustments, the investment value of the entire property of the company may be said to be \$61,849,879.

The following table contains the data above outlined:

ANNUAL INVESTMENT VALUE ON 8% AND 7% BASIS.

Year.	Cost of Plant First of Year.	7% on Value of Plant.	Additions to Plant, including Working Capital.	7% on Additions to Plant, Including Working Capital for 6 Months.	Operating Expenses, Including Depreciation.	Total Cost.	Gross Earnings.	Cost of Plant Close of Year.
1898	\$39,000,000	\$3,120,000	\$4,807,350	\$168,257	\$3,795,302	\$50,890,909	\$7,265,526	\$43,625,383
1899	43,625,383	3,490,031	3,858,421	135,045	4,277,447	55,386,327	8,096,320	47,290,007
1900	47,290,007	3,783,201	1,200,756	42,026	5,031,962	57,347,952	9,090,337	48,257,615
1901	48,257,615	3,860,609	2,788,124	97,584	5,404,278	60,408,210	9,663,746	50,744,464
1902	50,744,464	4,059,557	1,496,361	52,373	6,543,797	62,896,552	11,058,014	51,838,538
1903	51,838,538	4,147,083	1,039,516	36,383	7,096,794	64,158,314	11,854,801	52,303,513
1904	52,303,513	4,184,281	1,243,445	43,521	7,026,390	64,801,150	12,014,085	52,787,065
1905	52,787,065	4,222,965	1,622,192	56,777	7,305,773	65,994,772	12,284,363	53,710,409
1906	53,710,409	4,296,833	1,167,569	40,865	7,569,524	66,785,200	11,680,044	55,105,156
1907	55,105,156	3,857,361	798,704	27,955	8,817,035	68,606,211	13,146,368	55,459,843
1908	55,459,843	3,882,189	1,259,094	44,068	9,098,976	69,744,170	13,738,970	56,005,200
1909	56,005,200	3,920,364	3,050,290	106,760	9,539,185	72,621,799	14,561,589	58,060,210
1910	58,060,210	4,064,215	3,812,726	133,445	10,393,384	76,463,980	15,530,350	60,933,630

PAVING.

Although strongly argued by the company, no allowance has been made in the above total to cover the value of the pavement over the company's distribution system. It was claimed that since the valuation for the purpose of this investigation must be the reproduction cost, the company should be given credit for the value of the street pavement over all of its mains and services, even though the company paid no part of the cost of such pavement, since if the plant were to be reproduced as of this date it would be necessary to cut through such pavement for the purpose of laying the pipes. The facts show that on most of the streets the mains were put down before any pavement was laid by the city, and in many other streets the mains were laid at a time when the city was replacing the pavement, so that in either case the company was put to no expense because of the street improvement. Where, however, the company did cut through the pavement and replace it as required by the city ordinance, the cost thereof has been added to the cost of the mains and is now included in the valuation tables. The purpose throughout the appraisal of the distribution system was to allow a valuation where the company incurred pavement expenditures and to exclude any allowance for pavement laid and paid for by the city.

The pavement over the company's present distribution system, of which the street mains alone are nearly 2,600 miles in length, is reasonably worth \$6,000,000, but this is the investment of the people of Chicago and not the investment of the gas company. Even if the reproduction theory is to be carried to the utmost extent, it does not follow that the same distribution arrangement would be followed and that the same number of pipes would be placed in the streets as they exist at present. It is probable that much of the distribution system would be placed in alleys and parkways where the construction expense would be very much reduced. If, under the decisions of the courts, the above amount, together with the additional reproduction cost of cutting through all the pavement, must be allowed in the valuation, the investment value and the interest requirement will be very much increased. In the leading utility rate cases the court has failed to hold specifically that the value of the pavement over the mains not paid for by the company must be included in the plant values. In all such cases the paving item was very large, and if it were intended to include it in the valuation, it is reasonable to assume that the courts would have so stated. On the other hand, to exclude such pavement valuation has received the endorsement of the federal court and public service commissions. Every legitimate expenditure in adapting the utility to the demands of progress and community growth is a proper charge to construction, and as such the investment therefor is entitled to participate in the distribution of earnings from

operation. If expenditures for pavement are incurred by the utility in response to assessments levied by the city or are incurred in cutting through the pavement for construction purposes, these are proper capital charges. It does not seem reasonable, however, that a utility should be permitted to capitalize expenses for municipal betterments in which it has not participated, and when the benefits which accrue to it are remote and incidental. To do so would be to compel the customers for utility service to pay increased rates because of their civic progressiveness. For the above reason the city's expenditure for paving the streets over the company's distribution system is not regarded as a gas company investment in rate-adjustment proceedings; regardless of the value which may exist in a commercial sense because of such improvements. To include the cost of cutting through such an amount of pavement and its subsequent replacement would seem to be carrying the reproduction cost theory further than justice warrants.

VALUATION CONCLUSIONS.

The above detailed analysis leads to the conclusion that the investment value of the property owned by The Peoples Gas Light & Coke Company at the close of 1910 was approximately \$61,849,879. In arriving at this amount no allowance has been included for the value of the perpetual franchise or for the value of the pavement placed by the city over the company's distribution system. The above total includes the value of all the physical property, both that used and useful in the company's business and the commercial holdings, together with its necessary working capital and an allowance for going value as defined in this report.

Since the purpose of this inquiry is to determine a reasonable rate for manufactured gas, it is necessary to apportion such investment value over the utility service and the commercial service. The utility service at present, as explained, really consists of two distinct services, namely, the sale of manufactured gas, the heating and lighting standard of which is prescribed by ordinance and for which the present rate is 85 cents per thousand cubic feet, and the sale of natural gas sold in a restricted area of the city at a rate of 50 cents per thousand cubic feet. This necessitated the separation of the utility property over these two departments of service. The general office building and the real estate not used in the gas business has been excluded from the rate analysis. The company occupies only a portion of its new office building, the remaining space being rented for commercial purposes. For the purpose of this analysis it is optional to consider a portion of the above building as a gas investment or to exclude it entirely and to regard it as a commercial investment, at the same time making a charge in the operating expenses for rent based on the space now occupied by the company. This latter

alternative has been adopted and the cost of the building is, therefore, excluded from the investment upon which the gas service must yield a reasonable return, but there has been included in the operating expenses the proper rental allowance. Deducting from the total of \$61,849,879 for 1910 the office-building investment, the commercial property and the natural gas investment, and adjusting the total for the end of 1909, the period under investigation, the amount on which the rate of return must be applied in the computation of a reasonable rate for manufactured gas is \$51,575,678.

AUDIT.

The books of the company were audited for the year 1909, the period covered by this investigation. In the course of the audit the general ledger containing all the accounts which appeared on the company's trial balance was analyzed in detail and checked with the entries as appeared in the general journal. A trial balance was taken showing the balances January 1, 1908, the total charges and credits appearing on the ledger during the year and the balance as of December 31, 1909. The company's classification of accounts is very elaborate, making possible a cost analysis in considerable detail. All the vouchers and supplementary records such as invoices, pay-rolls, store requisitions and work orders, covering the disbursements of the company for the year 1909 were submitted in response to requests made and were carefully examined.

REVENUE.

The original records of earnings from all sources were checked in detail. The record of receipts from the sale of gas was carried in one hundred and four customers' ledgers containing over half a million accounts. It was impossible to check each of these volumes in the brief time allowed and with the facilities available, and it was deemed unnecessary to undertake such work. Certain parts of the customers' ledgers were audited in detail and the correctness of the conclusions verified by various checks against the sales and the plant output. In all instances the records were found complete and in great detail.

The revenue items appearing on the general books are as follows:

Gas Sales.....	\$13,663,168.01
Tar Sales.....	130,944.03
Receipts from Pintsch Company.....	132,579.10
Penalties.....	167,462.09
Interest.....	113,276.25
Rentals.....	17,591.06
Green Street Rentals.....	955.68
Interest on Securities.....	2,500.00
Arc Lamp Rentals.....	340,873.31
Carbide.....	870.23
Indiana Natural Gas & Oil Company.....	40,172.18
Miscellaneous Revenue.....	11,704.57
Total.....	<u>\$14,622,096.51</u>

The first and largest item in the above table consists of the following details:

	Cubic Feet.	Amount.
Private Consumers.....	15,804,066,517	\$13,435,464.05
City Meters.....	43,606,200	36,969.79
City Lamps.....	230,966,918	196,321.89
Private Lamps.....	344,546	292.87
Miscellaneous Sales.....	80,000	68.00
Gross Sales Gas.....	16,079,064,181	\$13,667,116.60
Less Adjustments.....		3,948.59
Net Revenue from Gas.....		\$13,633,168.01

Since the object of this investigation is to ascertain a reasonable rate for gas, it is necessary to apportion the earnings so as to show the proportion to be credited directly and indirectly to the gas utility department, and the amount which represents income from outside sources or commercial transactions which can not properly be applied to reduce the cost of gas. The amount so eliminated from the above total of \$14,622,096.51 is \$240,353.44 and consists of seven separate items.

There has been excluded from the revenue to be applied to the gas utility the amount received from the Pintsch Company. This income consists of rentals paid by the Pintsch Company for the use of a part of one of the company's stations. The amount of the investment of The Peoples Gas Light & Coke Company which has been leased to the Pintsch Company was excluded from the gas utility investment as not being used and useful in that service. Since the investment has been apportioned the income from the rental of the excluded portion is likewise excluded from the earnings.

The total amount received by the company in the form of interest is \$113,276.25. Practically 90 per cent of this total consists of interest on funds deposited in banks, a large part of which represents the proceeds from bond sales to be devoted to construction purposes. The total interest item has been analyzed so as to determine the reasonable income from this source which can be applied as a credit to the gas utility. Such analysis suggested the exclusion from the total of \$63,276.25 as being an extraordinary earning. The \$50,000 retained as an earning agrees favorably with the ordinary income from this source as shown by the records over a number of years. The rental received from the Green street property has been excluded because such property is not devoted to the gas industry and was also excluded from the plant valuation. For like reason, the interest on securities to the amount of \$2,500 was excluded. The receipt of \$870.23 from the sale of carbide is a strictly commercial transaction in no way connected with the gas utility, and for this reason has been excluded. There has further been deducted from

the total earnings the amount of \$40,172.18 received from the Indiana Natural Gas & Oil Company.

INDIANA NATURAL GAS & OIL COMPANY.

The Indiana Natural Gas & Oil Company is controlled by The Peoples Gas Light & Coke Company. It owns extensive pipe lines and pumping stations in Indiana, its pipe lines reaching to the southeast limits of Chicago, where they make connection with the mains of the controlling company. The company has a bonded indebtedness of \$6,000,000, which is a first lien on the entire property, and it is capitalized at \$2,000,000, all of which is deposited with the Central Trust Company of New York, the trustee, as additional security for the payment of the bonds. When such indebtedness is paid the stock is to become the property of The Peoples Gas Light & Coke Company. The controlling company under the charter of this company, is now engaged in the distribution and sale of natural gas in a restricted area in the city of Chicago. It keeps all the accounts and records for the natural gas department, renders the bills for such service and collects the revenue. Under the natural gas franchise The Peoples Gas Light & Coke Company distributes through a separate set of mains constructed for this purpose approximately 2,000,000,000 cubic feet of natural gas for fuel purposes. During the year 1909 the controlling company purchased approximately 2,000,000,000 cubic feet of coke-oven gas, which was transmitted to the One Hundred and Tenth street station, where it was purified and distributed, a portion of it being mixed with the water gas and distributed through the manufactured gas mains, while about 400,000,000 cubic feet was mixed with the natural gas and distributed through the natural gas mains.

The total earnings from the sale of natural gas in 1909 after making corrections for bad debts and allowances to the amount of \$885.50 was \$609,004.75. Against this amount there was charged the cost of the coke-oven gas purchased from the By-Product Coke Oven Corporation, the cost of purifying such gas and the gross earnings tax of 5 per cent amounting to \$30,417.69 paid to the city of Chicago. After deducting various other operating charges, there was remitted to the Indiana Natural Gas & Oil Company the sum of \$475,000, leaving a credit to The Peoples Gas Light & Coke Company of \$40,172.18, which was excluded from the revenue statement above.

The sale of natural gas being a service distinct and apart from the manufacture, distribution and sale of gas for illuminating and fuel purposes under the present 85-cent rate, all transactions connected with the natural gas service have been excluded from this calculation. The value of the property devoted to the natural gas business is shown in the tables

on valuation. In order that the manufactured gas department or service should be charged only with those expenses which it incurs and credited with the earnings from the sale of such gas, there have been excluded the earnings, operating expenses and investment of the natural gas department. If such service is to be continued, it should bear all the direct and indirect expenses which it incurs, and for the purpose of this investigation must be regarded as a separate service.

APPORTIONMENT OF REVENUE.

From the above explanations, the revenues of the company for the purpose of this investigation may be rearranged and stated as follows, in which form they are entered in the final income account:

Operating Revenue:		
Gas Sales.....	\$13,663,168.01	
Tar Sales.....	130,944.03	
Penalties.....	167,462.09	
Arc Lamp Rentals.....	340,873.31	
Total.....		\$14,302,447.44
Non-operating Utility Revenue:		
Interest.....	\$50,000.00	
Rentals.....	17,591.06	
Miscellaneous Revenue.....	11,704.57	
Total.....		\$79,295.63
Commercial and Extraordinary Revenue Excluded:		
Receipts from Pintsch Company.....	\$132,579.10	
Interest.....	63,276.25	
Green Street Rentals.....	955.68	
Interest on Securities.....	2,500.00	
Carbide.....	870.23	
Indiana Natural Gas & Oil Company....	40,172.18	
Total.....		240,353.44
Total Revenue, as per Ledger.....		\$14,622,096.51

OPERATING EXPENSES.

The company's profit and loss accounts were audited and each account analyzed in detail. While this examination particularly covered 1909, attention was also given to the accounts for the four preceding years and for 1910, in order to ascertain whether 1909 was in any manner an abnormal year from the standpoint of operation or whether the accounts for that period contained any extraordinary charges. The expenses as shown by the company's books consist of seven classes which are based upon the chronological steps in the manufacture, distribution and sale of its products. These classes and the total charges for each in 1909 were as follows:

Manufacturing Expense.....	\$3,601,058.51
Gas Purchased and Allied Expenses	747,156.81
Distribution Expense.....	1,367,810.05
Commercial Expense.....	57,569.60
Office Expense.....	701,683.94
General Expense.....	704,332.73
Annual Fixed Charges.....	4,329,381.36

Total.....	\$11,508,993.00
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The analysis of these accounts suggested certain adjustments for rate-making purposes, and a detailed study was therefore made of each account in order to obtain the amount which constituted a correct utility operating charge and also the reasonableness of such charges for the purposes indicated. As outlined above, there was deducted from the classified operating expense accounts a reasonable proportion for the natural gas department, and also all maintenance and administrative charges for other departments, on the theory that each department should be self-supporting. Various minor adjustments were made which were more in the nature of transfers from one group to another in order more clearly to show the correctness of departmental costs and also to meet specific operating conditions. The distribution of a number of expense items over construction, operation and maintenance was also changed with a small reduction resulting in operating expenses. There were, however, several changes of greater importance which deserve separate discussion.

LEASE RENTALS.

The Peoples Gas Light & Coke Company at present control, through leases, the property of the Ogden Gas Company and the Universal Gas Company. These plants have been acquired partly for the purpose of securing their productive capacity to supplement the plants now owned, but more particularly to remove competition in the local gas field. The rental charge under these leases amounting to \$580,000 annually is contained in the income account as one of the operating expenses, so that the reasonableness of such amount is a matter calling for careful consideration. Doubtless, the fact that these plants had an established business and were in a position to extend it with the growth of the city and the further fact that they were able to compete seriously with the older company, would warrant the payment of a rental charge somewhat in excess of a reasonable return on the fair present value of the physical property. But these facts should not serve as a means for paying through the operating expenses of the older company an amount in excess of a fair rental when all such elements and conditions are given due weight.

No appraisal of the two leased properties has ever been made and there is no inventory of their property to be had. The cost of reproduction must be determined from other sources, especially from such data as is available from capacity measurements and from personal

inspections. This course was pursued and an appraisal was made from all the data which could be obtained. The Ogden Gas Company property consists of a gas manufacturing station with a daily capacity of approximately 3,000,000 cubic feet and somewhat in excess of 77 miles of distribution mains. The Universal Gas Company owns a large manufacturing station with a daily capacity of nearly 12,000,000 cubic feet and 5½ miles of distribution mains. By applying the same unit costs to these properties as were used in appraising the physical property of the lessee company, a valuation was placed on the property covered by the two leases. The amount deemed a reasonable charge for the use of this property was determined from an allowance sufficient to cover those operating expenditures not assumed by The Peoples Gas Light & Coke Company and a return on the investment amounting in total to \$340,000 per year. The rental allowance in the income account has consequently been reduced by the sum of \$240,000.

DEPRECIATION CHARGE.

The provision for depreciation is a proper operating expense and allowance must be made for such a charge in the income account. Every public utility should set up an adequate depreciation reserve to provide against the wasting of assets, charging operating expense annually or at more frequent intervals with an amount representing the estimated depreciation during such period and making a corresponding credit to the depreciation reserve. Maintenance charges should cover only the upkeep of the property or the current ordinary repairs, renewals and replacements resulting through the use of the property or through those casualties which are incident to the nature of the operation and which expenditures are necessary in order to keep up the productive capacity of the plant to its original or equivalent state of efficiency. When, however, through wear and tear, inadequacy, obsolescence, supersession or public requirements, the unit of equipment becomes economically irreparable the uncurrent or extraordinary repairs, renewals or replacements made necessary should be charged to the depreciation reserve which has been accumulated for this purpose through charges to operating expenses.

To determine what constitutes a proper depreciation charge it is first necessary to compute the composite life of the plant. The length of life of the various parts of a gas plant vary greatly. Cast-iron mains, for example, have a very long life, while wrought iron mains and services have a much shorter period of use. Some of the machinery at the station may be used for fifty years. Other portions are consumed through use in less than ten years. The depreciation reserve to be provided must be such an amount as will permit of the replacement of each

item of equipment when such step becomes necessary. The composite life of the plant must be determined from a study of the reasonable life in service of each class of equipment. The gas industry is relatively old and much information is available to show the probable life of the different classes of property. Since the depreciation allowance must provide for all replacements, the adequacy and efficiency of the equipment must be considered as well as the actual physical life. Not all the property, however, is subject to depreciation. Land and working capital, for example, may be excluded from such a calculation as not depreciating in the sense in which that term is here used.

The life-table which was used as a basis for the determination of the required allowance in the present case was compiled from the records of manufacturers and utility companies, supplemented by the opinions and experience of those brought into close contact with equipment of this character under practical operating conditions. Local conditions affect the term of life and it is therefore necessary in estimating the depreciation to modify such periods to correspond with the conditions known to exist. Where output affects the life of the property a shorter period must be used if the apparatus is more heavily loaded than under average conditions. Climatic and soil conditions affect the life of the property and the growth of the business may render it necessary to substitute larger types of equipment before the normal life is run. It is also necessary to consider the skill of management and the state of repair in which the property is kept, since it is possible through proper handling to materially lengthen the life of the property in service. In preparing the life-table in this computation those various factors have been given due weight so that the assumptions used are deemed to be conservative under present conditions in Chicago. The following table contains the statistical data showing the calculation of the composite life of the property in question:

CALCULATION OF COMPOSITE LIFE-MANUFACTURED GAS PROPERTY.

CLASSIFICATION.	Depreciable Property.	Salvage Value.	Total Wearing Value.	Times Renewed in 75 Years.	Total Expenditure in 75 Years.	Total Dollar-years.
Property having 75 year Life....	\$8,921,772	\$ 8,203	\$8,913,569	1	\$8,913,569	\$668,517,679
Property having 65 year Life....	540,000	.....	540,000	1 $\frac{2}{3}$	623,077	40,500,005
Property having 50 year Life....	6,040,786	257,664	5,783,121	1 $\frac{1}{2}$	8,674,683	433,734,150
Property having 45 year Life....	2,482,774	.....	1,226,480	1 $\frac{1}{3}$	4,137,956	186,208,031
Property having 40 year Life....	598,036	.....	559,058	1 $\frac{1}{4}$	1,048,234	41,929,346
Property having 30 year Life....	178,825	38,978	176,570	2 $\frac{1}{2}$	441,424	13,242,729
Property having 25 year Life....	4,488,518	2,255	4,466,305	3	13,398,915	334,972,875
Property having 20 year Life....	5,375,447	22,213	5,300,529	3 $\frac{3}{4}$	19,876,983	397,539,667
Property having 15 year Life....	523,242	74,918	514,504	5	2,572,520	38,587,796
Property having 10 year Life....	350,327	8,738	350,327	7 $\frac{1}{2}$	2,627,453	26,274,530
Total.....	\$29,499,727	\$412,969	\$27,830,463	.....	\$62,314,814	\$2,181,506,808

In calculating the composite life the so-called straight line method was used. This method gives proper weight to the fact that the short-lived apparatus must be replaced several times during the life of the property having a longer life, so that the composite life determined in this manner will provide a fund sufficient to meet the replacements as they occur. All the property subject to depreciation has been classified according to its normal life in service and the cost new of such property for each classified age as shown. Since the salvage value can be secured from the property after its usefulness in service has terminated, this amount must be deducted from the cost new to show the amount which actually depreciates which is called in the table the "wearing value." The number of times each class of property will be renewed during the term of the longest life contained in the table is also shown, together with the total expenditures for replacement purposes during such longest life period. Having determined the total requirement during the entire period for each class of property it is necessary to multiply this amount in each case by the number of years during which each dollar is employed, giving the amount in the terms of "dollar years." By dividing this number by the total expenditure during this period of seventy-five years, there is shown the composite life of the property which in this case is practically thirty-five years. This computation embraces all the depreciable property devoted to the manufacture, distribution and sale of the manufactured gas, together with the proportion of the office building used by the company for this purpose. On the basis of the above life of thirty-five years and the assumption that an accumulation for depreciation would be able to earn 4 per cent interest, it would be necessary to set aside for this purpose $1\frac{1}{2}$ per cent of the total depreciable property each year. While this amount would be sufficient to meet the replacements as they normally occur, it is probable, due to the uncertainties of a business which extends for seventy-five years into the future, that some allowance should be made for contingencies and almost certain departures from conditions upon which the table is based. The replacement of services and mains will doubtless cost more in the future, due to the improvements in the streets, and the required reconstruction before the property in many instances has reached the point of complete depreciation will mean added costs. For this reason it is more than probable that some equipment will be abandoned before the end of assumed life and also that improvements in the process of manufacture will render obsolete some of the property now in use. Based on those considerations an annual allowance of 2 per cent on the depreciable property is sufficient to cover this requirement. Applying this percentage to the depreciable property in 1909 the allowance for depreciation is \$642,487, which amount is considered as an operating expense and included in the adjusted income account.

RETURN ON INVESTMENT.

Not only must the rate to be charged for gas be placed at such a figure as will yield sufficient revenue for operating expenses, taxes and depreciation, but it must provide a reasonable allowance as a return upon the investment. A rate sufficient to meet these requirements must be provided as a matter of law, but a considerable difference of opinion exists as to what may be said to constitute a reasonable rate of return. Clearly what is reasonable in one industry or under one set of conditions will not necessarily be reasonable in all cases. Capital flows from one field of industry to another in response to established economic laws. The attractiveness of an investment may be temporarily increased or diminished by public or legislative acts, but in the last analysis economic fundamentals govern. It therefore becomes necessary for the determination of this rate of return to consult a wider sphere of investment than that of this industry alone and to arrive at such a rate from the consideration of the entire investment world rather than from an abstract conclusion.

At the outset it is evident that the rate must provide at least that amount of return which is equal to the income from the least hazardous undertakings. The yield from bonds and mortgage investments are lower than the return from manufacturing and commercial investments because of the diminished risk and also because of the small amount of supervision required after such investment has been satisfactorily placed. The risk in an investment may be due to several causes, chief of which are the unstable nature of the industry, the severity of competition and the fixedness of the investment. In general the rate of return demanded by investors varies directly with the risks or hazards encountered in the business. This would indicate that the rate to be allowed on an investment in the gas industry must embrace two distinct elements; namely, that rate of interest to which a creditor is entitled as determined by the general cost of money in safe investment channels, and that rate of return over and above the interest, representing in a certain sense the profit of the partners or those who share the risks of the industry. That the holder of a single certificate may stand in the position of both creditor and partner is immaterial. There must be paid to capital, irrespective of who provides it, such a return as will yield a fair interest for the use of the money and an additional allowance determined by the risks of the enterprise.

The interest proportion of the return is indicated by the yield of approved mortgages and bonds. Such investments without burdens of management reasonably yield from $4\frac{1}{2}$ and 5 per cent to 6 per cent, depending upon a variety of conditions. The rate of profit to be allowed is a matter of judgment based upon general and specific conditions.

Among these may be mentioned risks inherent in the business, the probability of inventions rendering a part of the plant obsolete and greatly impairing the usefulness of the company's service, the degree of managerial skill and the probable future of the enterprise. As affecting more particularly a utility investment, reference may be made to the likelihood of condemnation for the purpose of public purchase, the frequency of public rate revision with its accompanying uncertainties and the danger of competing utilities in a city where the investment is already sufficient to supply the entire community. These conditions taken together tend to restrain the movement of capital into such investments, unless the rate of return provides some compensation for the risks assumed.

In favor of a comparatively low rate of return is the fact that the product of the company finds a ready market and that the sales are far more uniform and certain than in commercial undertakings. This is shown by the stability in gross earnings of utility companies during periods of business depression. While manufacturing companies are often compelled to close their establishments for a time or to greatly reduce their operating forces, utilities in general show practically no loss in revenue and often substantial improvement. The Peoples Gas Light & Coke Company is also especially favored through the ownership of a perpetual franchise, the value of which can not be doubted. These factors serve in part to offset certain disadvantages which warrant a somewhat higher rate of return. When all the factors bearing on the subject of interest and profit are considered together with respect to the investment here in question, it must be concluded that 7 per cent on the fair present value of the property devoted to the gas business is a reasonable and proper allowance.

GAS UTILITY INCOME ACCOUNT.

The foregoing financial data have been combined in the following income account for the gas utility alone, showing the operating revenues, the operating expenses, net earnings, indirect or non-operating utility revenues, the deductions from the gross corporate income and the surplus for the year:

INCOME ACCOUNT—GAS UTILITY—1909.

		Per M Sold
Operating Revenue:		
Gas Sales.....	\$13,663,168.01	.8496
Tar Sales.....	130,944.03	.0081
Penalties.....	167,462.09	.0104
Arc Lamp Rentals.....	340,873.31	.0212
Total Operating Revenue.....		\$14,302,447.44 .8893

Operating Expenses:		Per M Made
Manufacturing—		
Steam Material.....	\$ 160,451.74	.0112
Generator Material.....	2,874,299.24	.2007
Purifying Material.....	11,541.61	.0008
Station Supplies.....	30,279.35	.0021
Manufacturing Labor.....	341,832.68	.0239
Works Repairs.....	117,845.48	.0082
Engr. Dept. General Charges.....	45,897.73	.0032
Total.....		3,582,147.83 .2501
Gas Purchased and Allied Expenses.....		748,157.06 .2965
Distribution—		Per M Sold
Distribution Station Operation.....	\$ 82,924.54	.0052
Street Mains Maintenance.....	331,297.94	.0206
Service Pipe Maintenance.....	146,905.32	.0091
City Lamp Post Maintenance.....	16,599.98	.0010
Meter Maintenance.....	313,799.99	.0195
Gratuitous Work.....	151,112.78	.0094
Arc Lamp Maintenance.....	308,701.58	.0192
Total.....		1,351,342.13 .0840
Commercial Expense—		
Promotion Expense.....	\$ 139,701.50	.0087
Branch Store Expense.....	22,355.32	.0014
Appliance Expense.....	104,702.22	.0065
Total.....		57,354.60 .0036
Office Expense:		
Turn On and Off.....	\$ 61,752.89	.0038
Statement Taking.....	96,918.76	.0060
Bookkeeping.....	165,082.99	.0103
Collecting.....	136,025.56	.0085
Applications, Receiving, Auditing, etc.....	236,637.63	.0147
Total.....		696,417.83 .0433
General Expense—		
General Office Expense.....	\$ 379,834.55	.0237
Telephone Rentals.....	21,666.02	.0013
Rent.....	156,219.79	.0097
Legal Expense.....	26,338.56	.0016
Claims and Damages.....	54,000.00	.0034
Employees' Aid and Pensions Fund Allowance	133,372.00	.0083
Uncollectable Bills.....	60,508.01	.0038
Fire and Property Damage.....	42,000.00	.0026
Main Rentals.....	53,493.00	.0033
Lease Rentals.....	340,000.00	.0011
Total.....		1,267,431.93 .0788
Taxes.....		848,115.00 .0527
Depreciation.....		642,487.00 .0399
Sundry Revenue Requirements.....		153,941.00 .0096
Total Operating Expenses.....		9,347,394.38 .5812
Net Earnings.....		4,955,053.06 .3081

Non-Operating Utility Revenue:		
Interest.....	\$ 50,000.00	.0031
Rentals.....	17,591.06	.0011
Miscellaneous.....	11,704.57	.0007
Total Non-Operating Utility Revenue.....		79,295.63 .0049
Gross Corporate Income.....		5,034,348.69 .3130
Deductions from Gross Corporate Income:		
Return on Investment at 7%.....	3,610,297.00	.2245
Surplus.....	\$1,424,051.69	.0885

The above table, after deducting the operating expenses and an amount representing the return on the investment, shows that the revenue produced by the present rate of 85 cents per thousand cubic feet of gas is equal to nearly 9.8 per cent on the fair present value of the property. If 7 per cent represents a reasonable return for the investor there remains a surplus of \$1,424,051.69. During the year 1909 the company put into the distribution system a total of 16,845,175,000 cubic feet of gas, of which 14,323,047,000 cubic feet was manufactured water gas and 2,523,110,000 cubic feet purchased gas. The total amount sold to customers in that year was 16,079,064,181 cubic feet, the difference between the output and the sales being gas lost and unaccounted for. It will be seen that the surplus from these sales, over and above the actual requirements, is equivalent to 8.85 cents per thousand cubic feet sold. Applying this surplus to a reduction in rates, the data indicates that the present rate may be reduced by 8 cents per thousand cubic feet to a charge of 77 cents. Stating such a rate in terms of gross and net charges, the investigation leads to the conclusion that a reasonable charge for gas under present conditions would be 77 cents per thousand cubic feet, with a penalty of 10 cents per thousand for failure to pay the bill rendered before the expiration of such a time as may be deemed reasonable through the company's rules and regulations. Applying a rate of 77 cents per thousand cubic feet to the total sales of 1909 instead of the rate actually in force, and assuming the same operating charges and non-operating revenue, there remains after the payment of a return to the investor amounting to seven per cent on the present value of the investment, a surplus of \$141,753.

In considering a net rate of 77 cents it must be borne in mind that The Peoples Gas Light & Coke Company is required by public authority to supply gas of not less than 22 candle-power and a calorific value of not less than 600 B. T. U. Under these requirements, the company in 1909 supplied gas of approximately 24 candle-power and an average calorific value of nearly 685 B. T. U. Since the standard called for in most cities is considerably less it will be seen that the sum of 77 cents will purchase in the city of Chicago a gas of far superior quality to that generally sup-

plied in American cities, and the same sum in another city may purchase more than 1,000 cubic feet of gas, but it is of a much lower quality than that furnished in this city. The gas at present supplied in Chicago is reasonably worth from $3\frac{1}{2}$ to 4 cents per thousand cubic feet more than that furnished in other cities, especially in those cities where the present rates appear very low. Reduced to the same standards of quality, the net rate of 77 cents here recommended for Chicago is equivalent to at least as low as 73 cents per thousand in most of the other large cities in the United States.

Further, in passing upon the reasonableness of any charge for gas, it is necessary to consider the service furnished as well as the rate per thousand cubic feet. It is a matter of general knowledge, substantiated by investigation, that the service furnished by The Peoples Gas Light and Coke Company is uniformly excellent. Pursuant to city ordinances, extensive construction work has been carried on for several years, seeking to give a more uniform pressure than that which was previously supplied, and with the completion of this work the service will represent the best which engineering skill under present conditions can provide. This service, it may safely be said, is the equal of and in many instances superior to the service supplied in other cities. It is, therefore, of paramount importance that the reduced rate to be put into effect shall not be so low as to necessitate a reduction in the quality of service now furnished. The problem of rates is broader than the mere question of charge per thousand cubic feet. Lighting and heating standards and the quality of the service are inseparably connected with it.

In order to permit of a comparison of the above recommended rate with the charges for gas in leading American cities, a table has been compiled embracing cities in excess of 50,000 population and showing the gross and net rates in force. The data contained in the table was compiled from leading gas directories and information concerning rate comparisons prepared by companies for public distribution. Unfortunately, these several sources of information frequently differed as to the rate in force in a particular city, which difference was doubtless due to complicated rate schedules containing provisions for discounts varying with the amount consumed and fixed charges in the form of customer charges and service charges. An effort was made to secure the correct rate wherever the several compilations differed, and while a number of corrections were made, it is possible that some inaccuracy still exists because of changes in the schedule since the publication of the source of information relied upon and the failure of the companies in many instances to make comprehensive reports. The table of rates follows:

PRICE OF GAS IN LEADING CITIES OF OVER 50,000 POPULATION.

City.	State.	Population Served.	Per M Cubic Feet.	
			Gross.	Net.
Allentown.....	Pa.....	52,000	.....	\$1.10
Altoona.....	Pa.....	50,000	\$1.20	1.10
Atlanta.....	Ga.....	150,000	1.10	1.00
Baltimore.....	Md.....	600,000	1.10	.85*
Boston.....	Mass.....	625,000	.....	.80
Buffalo.....	N. Y.....	415,000	1.20	1.00
Brooklyn.....	N. Y.....	1,589,250	.....	.80
Bridgeport.....	Conn.....	100,000	1.10	1.00
Brockton.....	Mass.....	50,000	1.20	1.10
Dayton.....	Ohio.....	125,000	1.00	.85
Denver.....	Colo.....	215,000	.....	.70†
Detroit.....	Mich.....	420,000	.80	.50*
Des Moines.....	Iowa.....	100,000	1.10	1.00
Duluth.....	Minn.....	85,000	.90	.75
Cambridge.....	Mass.....	140,000	1.10	.85
Chattanooga.....	Tenn.....	75,000	1.10	1.00
Cleveland.....	Ohio.....	550,000	.....	.75
Columbus.....	Ohio.....	200,000	1.10	1.00
Fall River.....	Mass.....	115,000	.95	.85
Grand Rapids.....	Mich.....	108,000	.90	.50*
Harrisburg.....	Pa.....	80,000	.....	1.10
Hamilton.....	Ohio.....	50,000	.80	.50*
Hartford.....	Conn.....	105,000	1.00	.75*
Houston.....	Tex.....	100,000	1.25	1.15
Indianapolis.....	Ind.....	239,500	.....	.60
Knoxville.....	Tenn.....	50,000	1.10	1.00
Lancaster.....	Pa.....	50,000	1.10	1.00
Lawrence.....	Mass.....	74,000	1.00	.90
Lowell.....	Mass.....	95,000	1.10	.90
Los Angeles.....	Cal.....	325,000	.....	.80
Memphis.....	Tenn.....	175,000	1.10	1.00
Minneapolis.....	Minn.....	316,710	1.20	1.00
Milwaukee.....	Wis.....	370,000	.90	.60*
Mobile.....	Ala.....	50,000	1.25	1.15
New York.....	N. Y.....	2,410,000	.....	.80
New Haven.....	Conn.....	125,000	1.05	.95
New Orleans.....	La.....	350,000	1.40	1.15
Omaha.....	Neb.....	156,000	1.25	1.00
Philadelphia.....	Pa.....	1,600,000	.....	1.00
Pittsburg.....	Pa.....	550,000	1.00	.85
Portland.....	Ore.....	250,000	1.00	.95
Providence.....	R. I.....	215,000	1.05	.95
Reading.....	Pa.....	97,000	1.20	1.10
Richmond.....	Va.....	112,000	.....	.90
Rochester.....	N. Y.....	190,000	1.05	.95
Saginaw.....	Mich.....	55,000	1.15	.95
Salt Lake City.....	Utah.....	90,000	1.40	.70*
Seattle.....	Wash.....	280,000	1.25	1.00
Springfield.....	Mass.....	90,000	1.00	.90
St. Paul.....	Minn.....	215,000	1.20	1.00
St. Louis.....	Mo.....	750,000	.80	.60*
Tacoma.....	Wash.....	110,000	1.35	.80*
Terre Haute.....	Ind.....	80,000	1.00	.75*
Toledo.....	Ohio.....	200,000	1.10	.70*
Washington.....	D. C.....	330,000	1.10	.90
Waterbury.....	Conn.....	70,000	.....	1.10
Wilkesbarre.....	Pa.....	60,000	1.10	1.00
Wilmington.....	Del.....	90,000	1.10	.98
Worcester.....	Mass.....	138,000	1.20	.80

*Graduated scale of rates varying with consumption.

†In addition to the rate per M, the company exacts a demand charge and customer charge.

CONCLUSIONS.

	1910.	1909.
Total value of investment.....	\$61,849,879	\$58,060,210
Total value of physical property.....	49,023,947	44,494,972
Total "going value" as defined in the report.....	9,425,932	10,365,238
Gas utility investment including used proportion of office building.....		53,075,598

(Office building excluded from income account investment and rental charge for space occupied provided).

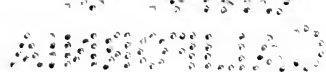
No allowance made for value of franchises.

No allowance made for the cost of street pavement over the Company's distribution system not paid for by the Company.

Allowance for working capital.....	\$3,200,000
Allowance for depreciation.....	642,487
Allowance for taxes.....	848,115
Rate of return allowed on the investment.....	7%
Gross operating revenues.....	14,302,447
Non-operating revenues.....	79,296
Present actual earnings available for interest and dividends.....	5,034,349
Allowance for return on present value of utility investment at 7%.....	3,610,297
Surplus in 1909 after allowance for interest and dividends.....	1,424,052
Present rate for gas..... 95 cents per M gross—85 cents per M net.	
Rate recommended..... 87 cents per M gross—77 cents per M net.	
Saving to public at 77 cents per M on 1909 basis.....	1,282,299
Probable saving in five years.....	7,400,000
Earnings available for interest and dividends under proposed rate.....	3,752,050
Surplus under proposed rate after allowance of 7% for return on investment..	141,753

All of which is respectfully submitted.

WILLIAM J. HAGENAH,
In charge of Gas Investigation.



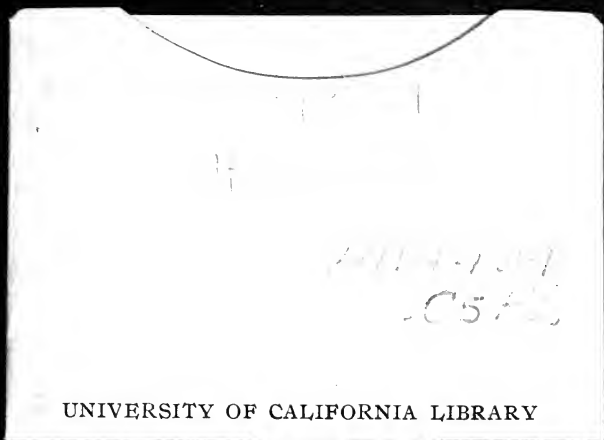
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